PAPYROLOGICA BRUXELLENSIA
— 16 —

ACTES
DU XV^e CONGRÈS INTERNATIONAL DE PAPYROLOGIE

PREMIÈRE PARTIE

ERIC G. TURNER

THE TERMS RECTO AND VERSO
THE ANATOMY OF THE PAPYRUS ROLL

BRUXELLES
Fondation Égyptologique Reine Élisabeth
1978

16

E. G. TURNER — THE TERMS RECTO AND VERSO — 1978

R 729/PAP(15)

BU DE BORDEAUX
0BXA0026508

ACTES
DU XV^e CONGRÈS INTERNATIONAL
DE PAPYROLOGIE

I

XVe CONGRÈS INTERNATIONAL DE PAPYROLOGIE
Bruxelles – Louvain 29 août – 3 septembre 1977

ACTES

ÉDITÉS PAR JEAN BINGEN ET GEORGES NACHTERGAEL

Publiés avec le concours du Fonds National de la Recherche Scientifique
et des Ministères de l'Éducation Nationale et de la Culture

PREMIÈRE PARTIE

RAPPORT INAUGURAL

D/1978/0705/03

IMPRIMERIE CULTURA · WETTEREN · BELGIQUE

01930417X

PAPYROLOGICA BRUXELLENSIA
— 16 —

ACTES
DU XVe CONGRÈS INTERNATIONAL DE PAPYROLOGIE

PREMIÈRE PARTIE

ERIC G. TURNER

THE TERMS RECTO AND VERSO
THE ANATOMY OF THE PAPYRUS ROLL

BRUXELLES
FONDATION ÉGYPTOLOGIQUE REINE ÉLISABETH
1978

R 729/PAP(15)
INVENTAIRE
BORDEAUX III
CENTRE PIERRE PARIS
16850
III-4-4

En toute amitié à M. Marcel Hombert,
l'ami des papyrologues,
le fondateur de leurs congrès internationaux.

E. G. T.

TABLE OF CONTENTS

1. Introduction 7

2. The term 'Recto', as traditionally used 8

First use of recto (1663) = side written first, verso (*folio verso*) continuation of same text on back = true opisthograph.
Applicable to ostraca, codices, charters, printed books.

3. The term 'Recto' in papyrological usage 11

On discovery of papyrus roll (and fragments of rolls), written on both sides but containing different texts, redefinition of recto and verso (Wilcken) in terms of material properties of papyrus roll. Manufacture; manufacturer does not sell single sheets. The roll: terms 'height', 'length', *kollema*, *kollesis*, *protokollon*, *eschatokollion*. Recto = *inside* of roll, where *kolleseis* (sheet-joins), more easily identifiable than on outside, run perpendicular to fibres, and writing is perpendicular to *kolleseis*. Apparent exceptions and anomalies. Roll normally placed to form horizontal band across lap or field of vision of reader.

4. Transversa charta: sorting out the confusion 26

(1) Confusion caused by use of terms in sense **2** or sense **3**.
(2) Greatest misunderstanding: failure to note existence of rolls which stretch vertically, not horizontally (rotuli): e.g. P. Lond. 1178, P. Lond. 229, P. Oxy. 2851.
(3) = writing *transversa charta*. Roll is rotated through 90 degrees, fibres run vertically on inside, *kolleseis* are horizontal, and writing is parallel to them, usually from edge to edge.
(4)-(9) Usage of rolls written *transversa charta*: always documentary in antiquity. Ptolemaic practice (Elephantine double documents) an offshoot of Pharaonic and parent of Roman practice. Double documents drawn up according to Roman law always *transversa charta*. List.
(10)-(11) Some questions of scribal practice.
(12)-(15) Link with Byzantine usage: rotuli from Kom Ishgau, Syene, Ravenna, Papal Diplomata, Liturgical and Exultet Rolls.
(16) Vindolanda Tablets comparable with rotuli, not codices.

5. Some difficult cases 54

6. The sizes of sheets in a roll 61

7. Practical recommendations 63

Addenda 66

Bibliography 67

1

INTRODUCTION

In honorem Ulrich Wilcken.

1.1 I have nothing that is really new to say — new in the sense that I have come across an important revolutionary discovery. Nevertheless by a combination of historical description and analytical method I shall try to put into developmental perspective the different ways in which the terms 'recto' and 'verso' have been used by papyrologists; and end with some suggestions for a notation that may avoid confusions in the future. The historical description is necessary so that future scholars may be able to understand what meaning any particular editor of papyrus texts during the last hundred years is likely to have attached to his use of the terms. As will be seen, there is a great danger of an apparently agreed terminology concealing, not clarifying the truth. I feel also that I owe it to the papyrological world to come back to the whole question because my own exposition in *Greek Papyri* (Turner 1968) (*) fell short of the ideal as regards clarity; and because there is a serious omission from the account there given.

1.2 Moreover, as I have progressed in the writing of this paper, I have come across so many surprising, sometimes positively misleading, statements by papyrologists of reputation, in whom I include myself, that I have concluded that the nature and mechanics of the papyrus roll are among the things that papyrologists least comprehend. To this general condemnation there is one shining exception: Ulrich Wilcken was not only a first-rate decipherer and interpreter of papyrus texts, he was also a superb palaeographer, and he understood the papyrus roll. It is a pity that he did not systematically set out the anatomy of the papyrus roll in Graeco-Roman antiquity. What he did not undertake I shall attempt in this paper.

(*) References are all in the form author, year, page-reference. The key is given by the bibliography on pp. 67 ff. A first draft of this paper has been read and much improved by Messrs A. Bowman, W. E. H. Cockle, P. J. Parsons, T. S. Pattie, C. H. Roberts, J. R. Rea and T. C. Skeat. I should like to thank them here for their interesting suggestions and trenchant criticism. They are not to be held responsible for the remaining errors or for the opinions expressed. I wish also to thank Dr. Cockle for help in checking the proofs.

2

THE TERM 'RECTO' AS TRADITIONALLY USED

First use of recto (1663) = side written first, verso (*folio verso*) continuation of same text on back = true opisthograph. Applicable to ostraca, codices, charters, printed books.

2.1 The earliest reference I have found to the terms 'recto' and 'verso' is in a French Dictionary which alludes to the year 1663 (Robert 1962). I cannot believe these are the earliest occurrences and shall be grateful for any references that carry use of these terms further back in time.

In this dictionary the source is unfortunately not identified. The definition in this case, as in all early references traced by me, starts from the phrase 'folio verso' and then proceeds to define 'recto' in relation to it, namely as its opposite.

The meaning of the term 'folio verso' is transparent: in form it is a Latin ablative absolute, using the verb 'vertere', to 'turn over'; '*folio verso*' = 'the leaf having been turned over', i.e. the back of the leaf. The meaning of 'folio recto' is not equally transparent. Does it mean 'the leaf being on the right-hand'? Or 'the leaf being right'? — i.e. 'the right way up'? or even 'upright'? I find a repetition of this definition in Diderot's Encyclopaedia (Diderot 1765), Vol. XVII s.v. VERSO: 'terme latin qui signifie le revers de quelque chose. Il est demeuré en usage dans la pratique du palais du tems que l'on rédigeoit les actes en latin, pour exprimer le revers d'un feuillet. Le dessus s'appelle le *recto* du feuillet, et le dessous *verso*, parceque, pour le voir, il faut tourner le feuillet'. In Vol. XIII s.v. RECTO we read: 'terme du palais; ce terme est fréquemment employé au palais, quand on cite la page d'un ancien registre ou d'un ancien livre. *Recto* est la page du livre ouvert qui se présente d'abord à la droite du lecteur; c'est l'opposé du verso'.

In the English language the first reference I have found cited is dated to 1839 (taken from The Oxford English Dictionary (= Murray 1888-), s.v. verso) '1839: 'Halliwell, Maundevile introd. p. xiii: "see f. 2, v°". 1850 Forshall and Madden, Wycliffite Bible I p. lxi: "the verso commences with the eleventh chapter of the Epistle to the Romans"'.

It is to be noted that neither Jean Mabillon in 1681 nor Bernard de Montfaucon in 1708 used these terms. Mabillon speaks of the 'front' as 'in adversa charta', the back as 'in aversa charta', and of 'chartae' as 'opistografae'. For 'verso' Montfaucon's phrase is 'in pagina aversa eiusdem folii'.

The use of 'aversus' is good classical Latin; for *aversus* meaning 'on the back' one may quote e.g. Martial 8.62.1 scribit in aversa Picens epigrammata charta, 'Picens turns the roll over and writes epigrams on the back'. Similarly Pliny n.h. xiii 79 uses 'ex aversis' for 'from the back'. *Inversus* is also used, Martial 4.86.11 inversa pueris arande charta (of a roll turned over and used by schoolboys for their exercises, when it does not meet the worse fate of wrapping up the fish and chips). The ancients used also 'tergum' for the back of a roll, Juv. I. 6, 'scriptus et in tergo necdum finitus Orestes'; and from the Greeks they borrowed the term *opisthographus* (e.g. Pliny Ep. 3.5.17). 'Adversus', however, seems to have been coined by Mabillon or else blessed by mediaeval usage, simply as the opposite of 'aversus'. (No example of 'adversus' in connection with book practice in T.L.L.; the opposition is, of course, implicit in such phrases as Columella: De re rustica I.5.4 'aedificii frons aversa sit ab infestis ventis . . . et amicissimis adversa'.)

2.2 The principle of description on which this use of terms is based is the contents of the text in question. A charter begins on one side, and if necessary continues on its back; a page of a manuscript in codex form can be recognized from its content to give a continuous sense when it is turned over. Even if such a manuscript has come to pieces, its leaves can be put into order again by a reader attentive to the continuous sense of their contents. An ostracon may begin on one side of the potsherd and continue on the other; the same will apply to other forms of writing surface, wooden or lead tablets, a piece of limestone, etc.

This is the sense given today to the terms 'recto' and 'verso' by the Belgian scholar Abbé van Haelst, and used by him in his valuable catalogue of Christian, Jewish and Liturgical Papyri (Van Haelst 1976 p. 7): 'quelle que soit la nature du support (papyrus, volumen, ostracon), recto signifie le côté du fragment sur lequel le copiste a commencé à écrire son texte, verso celui sur lequel il a continué, ou sur lequel un autre copiste, postérieur, a écrit'. Bingen 1977 p. 17 uses the term 'recto' 'dans le sens purement conventionnel de "face de la première utilisation".'

2.3 From this conception it is an easy jump to the definition given in the New English Dictionary, already used as we have seen in Diderot's encyclopaedia, and repeated in the most recent editions of the Shorter Oxford English Dictionary: 'the left-hand page of a book is the *verso* of that leaf, and faces the *recto* of the next'. That is to say, 'when the leaf has been turned over in a forward direction', a *recto* page is a right-hand page of a manuscript or printed book, a *verso* page is a left-hand page. This is the accepted meaning of these terms in printer's usage and in manuals of bibliography. In Esdaile's manual, for instance (Esdaile 1931 p. 62) this meaning of the term is taken for granted, even though it is nowhere defined. It appears for instance in such phrases as 'the last verso of a quire', 'the first and second rectos of a quire'.

It is the meaning also that I have used for recto and verso throughout *The Typology of the Early Codex* (Turner 1977) when describing codices. In the most recent volumes of *The Oxyrhynchus Papyri* it is referred to as the 'time-honoured meaning' of the terms (XLII p. xv ; XLIII p. xiv ; XLIV p. xvi).

2.4 Applied to manuscripts in codex form belonging to the western tradition, in which the writing proceeds from left to right, the equivalence of *recto* = right-hand page, *verso* = left-hand page is convenient and not misleading. This proviso is essential. For **2.2** and **2.3** are not in agreement if the writing (as in Hebrew and Arabic, for example) runs from right to left, and a reader starts from what a European would regard as the end of the book and works 'backward' to what a European would regard as its beginning. In such a case it is the left-hand page that should be the 'recto' (according to **2.2**), the right-hand page the 'verso'.

2.5 It is clear that if on one and the same sheet(s) two separate texts are written, and one of those texts is continued on the other side, using any accidentally empty space, there will be possibilities of ambiguity between the terms 'recto' = front, verso = 'back' : they will not be the same for the two texts.

3

THE TERM 'RECTO' IN PAPYROLOGICAL USAGE

On discovery of papyrus roll (and fragments of rolls), written on both sides but containing different texts, redefinition of recto and verso (Wilcken) in terms of material properties of papyrus roll. Manufacture ; manufacturer does not sell single sheets. The roll : terms 'height', 'length', *kollema, kollesis, protokollon, eschatokollion.* Recto = *inside* of roll, where *kolleseis* (sheet-joins), more easily identifiable than on outside, run perpendicular to fibres, and writing is perpendicular to *kolleseis.* Apparent exceptions and anomalies. Roll normally placed to form horizontal band across lap or field of vision of reader.

3.1 The matter became more complicated when during the nineteenth century the palaeographer came face to face with papyrus material surviving directly from the ancient world. Manuscripts in codex form written on papyrus could easily be accommodated inside the old terminology. But right from the early days of papyrus publications in the nineteenth century most papyrus material recovered from Egypt showed three new features :

(a) Both documents and books were in roll-form, inscribed on a continuous length of writing material.

(b) If both sides of the papyrus roll had been inscribed with continuous writing of any length, one side was usually found to be in a different handwriting from that on the other, and usually the text was not the same, i.e. not strictly an opisthograph, for which see **5.3** below. The problem therefore arose of determining which was written first. It could not be done following the criterion of **2.1** and **2.2.**, since the text on the other side was rarely a continuation of that on the first side. Moreover, at a time when palaeographers needed to assemble criteria for dating handwritings, the need to distinguish between 'front' and 'back' became acute. Often the text on one side might prove to be a document containing a date. Such a piece of papyrus clearly offered valuable evidence for dating undated literary handwritings. If the dated document were on the 'back', then the text on the 'front' was of earlier date ; if the 'front' carried the dated document, it offered a *terminus post quem* for dating the literary hand on the back (on this matter cf. Turner 1954).

(c) Only too frequently papyrus texts were smallish in size, and often fragmented. Examples of complete rolls or even sizeable portions of rolls were the exception rather than the rule. In the case of small portions of papyrus there was often no obvious way to decide from mere inspection which was the 'front' and which the 'back'.

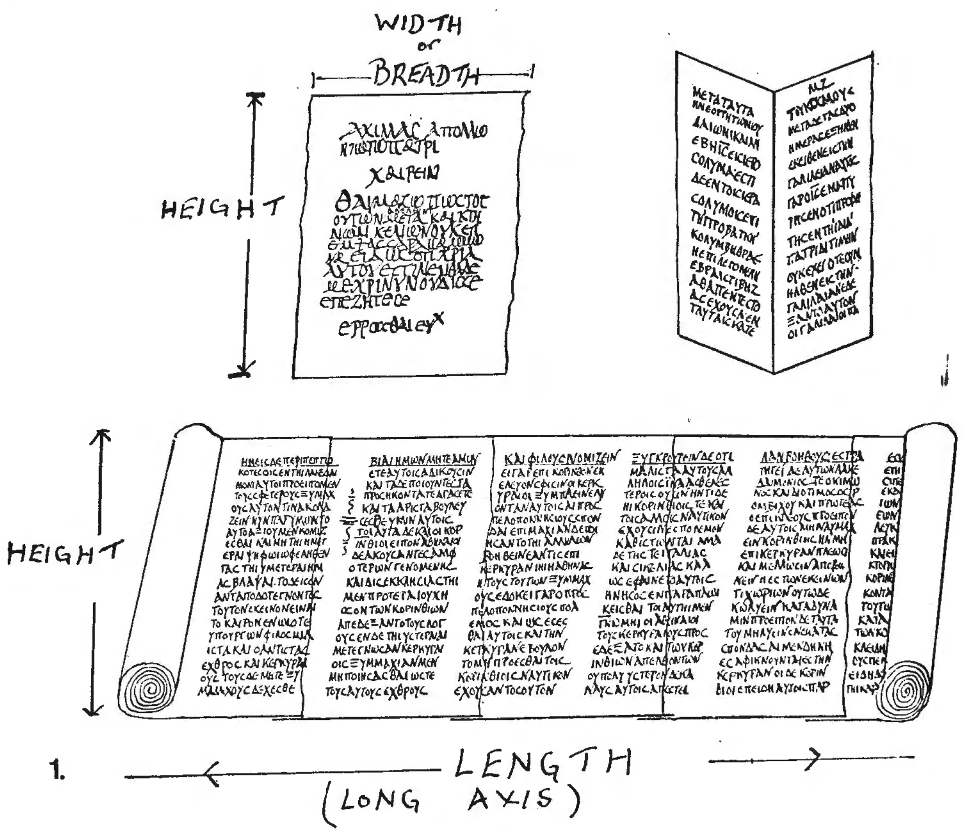
3.2 The strength of tradition was such that papyrologists continued to use the established terms 'recto' and 'verso' for their new material. But they began to use them in a new way. Under the influence of the strong personality of Ulrich Wilcken, who expressed himself forcefully in a series of papers (1887; 1888; 1891; 1901; 1906), had handled a very considerable amount of material, and was strongly supported by Grenfell and Hunt (Grenfell and Hunt 1897), 'recto' and 'verso' were defined in terms of the properties of the material on which the texts were written, not the contents of the text.

An accepted definition was not reached at once, and it is possible to see Wilcken having several shots at the problem of definition and discarding failures as their weaknesses became evident. For instance, he tried argumentation from the shape of the individual sheets out of which the pasted papyrus roll was composed, laying it down that these were rectangular and that the 'recto' side was that on which the fibres (and the writing) ran horizontally across the shorter dimension, the breadth, not the height of the sheet. In this approach, which as far as I can see lay behind his thinking down to the end of his productive life, he was influenced by the current interpretation of 'charta' as a single sheet of papyrus (cf. **4**.**3**.2 below). This approach can have a certain utility when handled by a scholar who knows its limitations (see below **5.2**.4). The most important limitation is that one must first be quite sure that the sheet in question was not cut down in size in antiquity — a limitation that unfits this approach for general use.

Wilcken tried also the argument from greater smoothness and finer finish of the papyrus on the recto. But this too is a will o' the wisp, even though it is still repeated (e.g. Bataille-Cadell 1966, 'fibres plus lisses'; Lewis 1974, p. 57). Lewis writes: 'Pliny's "tenuitas" and "levor" apply to the recto, i.e. the upper (horizontal) layer of the papyrus sheet, which was prepared as the primary writing surface'. It must be pointed out that this is interpretation, not a statement by Pliny at n.h. xiii 78. The nearest that Pliny comes to such a statement is at § 79 where he does say that in one particular kind of sheet, the *Claudia*, the 'subtemina' were of first-grade material, the 'statumina' of second-grade, and Lewis p. 46 and p. 62 interprets these terms as the horizontal and vertical strips. That one side was smoother than the other was trenchantly denied by Ibscher 1913 p. 191. Certainly I can enumerate papyrus sheets and rolls of which one side is palpably smoother than the other; but I can also enumerate many examples where I should hesitate to make such a judgment, and the number of times practised palaeographers have been tripped up shows how difficult a criterion it is to use.

Broadly speaking, three stages can be traced before an acceptable result was reached. Firstly, 'recto' was defined as that side of the papyrus on which the fibres ran in a horizontal direction and the writing went with them, 'verso' that in which the fibres ran in a vertical direction. This did not settle the ambiguities posed by the case of the single sheet, on both sides of which the writing ran with or across the fibres (see below § **5.2.7**). Such a sheet could have been rotated through ninety degrees when it was turned over. In the second definition the 'Sitz im Leben' of the sheet in the roll was introduced to meet just this ambiguity. The 'recto' side was the inside of the roll as originally manufactured by the papyrus-maker, the 'verso' was the outside of the roll. In his third definition (Wilcken 1901 and 1906) he laid down how the inside of a roll was to be recognized: it is that side on which it is possible to see the pasted joins between the sheets of which the roll is composed: 'Wo aber die Klebung zu sehen ist, da ist Rekto' (1901 p. 356). In my original draft of this paper I went on to write 'indeed it is the only side on which it is possible to see them'. For this statement I have rightly been faulted by Parsons and Rea. Turn the papyrus over and the joins can be seen if you know where to look and look very closely. But on the other side, the vertical fibres camouflage them very successfully, and often make them difficult to identify with certainty. There may be a further reason also (discussed § **3.3**.5 below). If you want to identify them, then the side of the papyrus on which to look is that on which the fibres run horizontally. That makes the pasted joins run perpendicularly to the lay of the fibres, in consequence of which they become relatively easier to spot. This further refinement has often escaped the notice of practising papyrologists. Indeed I must plead guilty to not having given it mention myself in my own attempt to define 'Recto and Verso' in *Greek Papyri* (Turner 1968 p. 4). H. Ibscher (Ibscher 1913) who had handled very many papyrus texts offered his confirmation of Wilcken's definition in 1913.

3.3.1 These points will become clearer if illustrated diagrammatically, and the method of manufacture of papyrus is briefly recalled. The methods of manufacture have had much attention devoted to them — above all by N. Lewis (1974). But the mechanics of the roll are still very little understood by scholars; and the editors of new texts rarely give the details which will help to mend this state of affairs.



1.

3.3.2 I shall repeat here what I have already set out in summary form in *The Typology of the Early Codex* (Turner 1977 p. 44): —

> "The papyrus reed grows to a height of seven feet or more. It has a triangular stem. From one of its triangular faces the coarse rind is trimmed away and long ribands are torn (or cut — but experience shows that tearing produces a more uniform riband). These ribands are laid side by side on a hard, smooth surface, not so close that they overlap, nor so far apart that on drying shrinkage will leave a gap between them: above them a second layer is placed with equal care at right angles. A few blows with a mallet make these two layers coalesce firmly; the natural juices ("polyesters", as the chemist would term them) cause them to adhere without any added gum. The size of sheet this will make (we are speaking now of the manufactured unit) depends on the skill of the craftsman. The largest known [until the Byzantine age, see § **6** below] is 46 cm. (about 19 in.) high, but it is rare to find one more than about 37 cm. (15 in.) in the Roman period, and about 28-30 cm. (11-12 ins.) is a good height then. The Elder Pliny gives a table of sizes according to breadth (he does not mention height) and their trade names. These sheets were made separately, and then [pasted] together into rolls — sold at the stationer's in units of twenty, fifty or even seventy sheets. In these rolls the horizontal fibres are placed on the inside where they are best protected from the constant strain involved in rolling and unrolling. Since the inside of the roll is also most easily protected from damage, it is the side usually chosen to carry the writing."

3.3.3 The diagram will illustrate these points. Let us first lay down a point of terminology: as can be seen in figure 1 (the diagram at **3.3**.1), 'length' of the roll is the distance from beginning of the first sheet to the end of the last sheet measured in the direction in which it is rolled, in other words it is the long axis of the roll; 'height' of the roll is the other dimension, the short axis; 'height' is a natural expression when the roll is thought of as running horizontally before the reader's field of vision, and one which can also readily be applied to the constituent sheets of the roll. The term 'width' or 'breadth' is equivocal in relation to the roll and should not be used to describe it. It may of course entirely correctly be used in describing the constituent sheets.

3.3.4 These constituent sheets were not sold by the manufacturer as separate sheets. He was well aware of the one specific weakness of papyrus as a material, namely its tendency to fray at the edges (a point noted by Youtie 1936 when he remarked that the fore-edge of a papyrus codex is particularly liable to damage). The manufacturer therefore pasted his sheets together to form a roll. The sheets overlap by a varying amount, usually about 2 cm., but sometimes up to 4-5 cm. The sheet on the right is inserted under its (preceding) sheet on the left. (Actually this statement is true only of rolls used by Greek scribes. It is not true of rolls used by Demotic scribes, as we shall see in a moment, § **3.4.5**.) The point where the left-hand sheet stops may not necessarily be a true vertical running down the whole height of the roll. In a really well-made roll it may be very difficult to detect. On a photograph it may be impossible to detect it. There is of course an additional reason why it should be particularly difficult on a photograph. The photographer's aim is usually to produce the maximum contrast between the writing and its background. In consequence the nature of the papyrus surface rarely emerges clearly in photographic reproduction. As a term to describe these sheet-joins I shall coin the Greek word *kollêsis*, and use *k* as abbreviation for it; a *kollesis* is usually visible as a line of junction between two single sheets (*kollemata*). Strictly it should denote the whole area of overlap which normally precedes that visible point of contact. But it will be convenient in what follows to use it for the point of junction of one *kollêma* and another. I have already used this term in *The Typology of the Early Codex* (Turner 1977), and because parts of this book have circulated in manuscript the term has already been widely taken up. (Actually I believe the first printed occurrence of the term is in Sterling Dow's paper on P. Hawara 24, Dow 1968 p. 63. Professor Dow and I discussed this papyrus together, but I do not remember which of us coined the term.) Wilcken called sheet-joins 'Klebungen', Grenfell and Hunt 'junctions'; and 'jonction' or 'jointure' are also the French terms. As stated, they are regularly at right angles to the horizontal fibres of the sheets which they join. Their presence in a piece of papyrus ought to be an essential element in the physical description of it by an editor, as should also the distance between *kolleseis* (i.e. the width of the *kollema*). Wilcken was scrupulous in noting these details; they occur in his palaeographical descriptions as early as 1891 (1891 p. xi on No. VIIa) and in his very earliest transcripts in BGU I 3,4). But his colleagues, alas, did not imitate him. Nor, alas, did Grenfell and Hunt, and it is a point where their otherwise paradeigmatic editions fell short.

3.3.5 The mechanical principles underlying the construction of the roll are usually quickly dismissed in some such phrase as that the tension on the vertical fibres would destroy them if they were on the inside of the roll. This is put more precisely by Černý 1952 p. 10: 'The strip was never rolled with the horizontal fibres outside and the vertical fibres inside, for by such a procedure the vertical fibres would be compressed into a diminishing perimeter, with the result that they would come apart, while, when rolled the other way, they would be spread evenly around an increasing perimeter, and, in unrolling, would again fall into their original position.' James M. Robinson (1977 p. 5) puts it more shortly: 'the vertical fibres on the outside are bent away from each other when rolled; if the vertical fibres had been on the inside, the rolling would have pushed them one against the other, causing some to spring loose and buckle'. Another consideration, as pointed out by Mr. T. C. Skeat, is the protection of the kollesis-join. If a roll was rolled-up with the horizontal fibres outside, the kollesis join would itself be subjected to strain; the sheet-ends would be bent away from each other, would fray, and eventually the join would tend to spring apart.

This is, in fact, the positive advantage of so arranging the roll that the horizontal fibres are inside: the joins are pressed into each other in the act of rolling up the papyrus. The kolleseis, in fact, are the barriers to fraying during the process of rolling and unrolling. That a papyrus sheet was liable to fray at its edges was well known to the ancients. Martial recommends the use of a reading stand (*manuale*) in order to protect the exposed edges of a roll from fraying by catching on one's clothing:

> Ne toga barbatos faciat vel paenula libros
> Haec abies chartis tempora longa dabit. (XIV 84).

Such a portable reading stand (essentially a back-board of larger height than the roll, and enough width to accommodate an adequate extent of opened roll) has been plausibly recognized by Binsfeld (1973) in a relief of the Roman period found at Neumagen, and now in the Trier Museum. Such fraying would of course be particularly destructive of the bottom edge of the papyrus roll, the vertical fibres of which would then fray. We have already noted Professor Youtie's observation that the fore-edge of a codex page is particularly liable to damage. In a roll there are no fore-edges, and the horizontal fibres are nowhere exposed, and are therefore protected against fraying. Special arrangements were made to protect its first useable sheet (by adding the *protokollon* **3.5**) and probably the end was similarly protected by a special last sheet. The end in any case may have enjoyed the further protection of a wooden roller. The intervening sheets were pasted to each other at least as much for their own protection as to constitute a long continuous writing surface. The strength of the roll at the kollesis is usually such that it is very rarely broken; as editors of literary papyri will know, it is the papyrus on either side of the kollesis that breaks, not the kollesis itself.

3.4 The argument based on the physical properties of the papyrus roll may now be restated: —

3.4.1 The manufacturer did not sell single sheets of papyrus, but made them up into rolls. In these ready-made rolls the inside of the roll was intended to carry the writing. It was protected from damage; its sheet-joins, perpendicular on the inside to the fibres, were carefully smoothed so as to offer no obstacle to the pen; the direction of its fibres was horizontal, not because that side of the papyrus having horizontal fibres was necessarily smoother, but because with this arrangement the sheet-joins were protected from coming apart; and they themselves prevented fraying of the surface during the act of rolling-up and unrolling. Special arrangements were made to protect the first sheet of all and probably also the last sheet.

3.4.2 Naturally therefore scribes wrote first on the inside of a roll or of a piece cut from a roll. Writing on the outside of a roll was therefore always later than that inside.

3.4.3 Even in a single piece of papyrus cut from a roll the side which originally lay inside the roll can be determined if a single pasted kollesis survives, for on that side only will the kollesis be readily identifiable and the fibres will be at right angles to it (see however **3.6**).

3.4.4 Even when the surviving fragment of papyrus is small, the presence of a kollesis may indicate, if it is a literary roll, that the text is part of a work copied in extenso. Unless the passage in question is a quotation, it has usually been assumed that the roll contained the whole of that work or book of which the portion has been identified. The case, however, of P. Oxy. VII 1016 is a warning against generalizing from this assumption. It contains 6 columns of Plato's *Phaedrus* from the opening words (top of the first column) to p. 230c (foot of the sixth column). Thereafter there is blank papyrus to the right: only the proem of the *Phaedrus* was copied therefore. A warning of another kind is offered by P. Oxy. III 409, which is revealed by P. Oxy. X 1237 (cf. XXXIII 2655 introd.) to contain extracts only, not the complete text, of Menander's *Kolax*. See also below § **5.2.6**.

It will appear on reflection that these considerations have different degrees of cogency. **3.4.1** is a matter of observation, and even to the matter under observation there may be exceptions. **3.4.2**-**3.4.4** are deductions from that observation.

Statement **3.4.2** seems to be deliberately flouted in the documentary P. Teb. I 41, 119 B.C., a draft petition to the archiphylacites. Grenfell and Hunt write *ad loc.* 'The writing is on the verso of the papyrus, the recto being blank. As there is a junction of two *selides* down the papyrus, there can be no doubt that it is a real exception to Wilcken's law about recto and verso, like [P. Teb. I] 50, 128, 139, 181, 196, 223, 227, 240 and P. Brit. Mus. 401; cf. 15 introd.'.

I should like to be able to inspect the original. Presumably when Grenfell and Hunt say 'there is a junction of two *selides* down the papyrus' they mean that this junction is to be seen on the other side from that which bears the writing.

Even if this is so, this document may not be a true exception to the general rule. We note that it is a *draft* petition, not the final petition, for it contains many marginal corrections, and after it was finished a large part of it was rewritten. To this example, then, may apply the remark made by Grenfell and Hunt about P. Teb. I 15 (p. 83), which contains drafts of two letters: 'the drafts of the letters are written upon the verso of the papyrus, the recto being blank; but probably this piece was originally part of a larger document'. The implication of this compressed statement is that the recto was a long document, in which there were a number of considerable blank spaces. We may recollect that the document (P. Oxy. VI 985), on the back of which the Hypsipyle of Euripides (P. Oxy. VI 852) was copied, also showed a considerable number of large blank spaces. Had only fr. 62, 70, 96 for instance, survived, they might have been taken as an exception to the general rule. In the case of P. Teb. I 41 one must remember that Grenfell and Hunt were remarkably well informed about the importance of their statement. It can therefore be disregarded only at our peril.

3.4.5 Some remarks in my first draft on apparent exceptions to the regular way of making kollesis joins have stimulated Mr. T. S. Pattie to examine one supposed anomaly (P. Lond. III 604) and to reach an interesting conclusion, which he has permitted me to insert here. He writes: 'I have examined 18 demotic papyri from Thebes and Hermonthis, 311 B.C. - 179/8 B.C. All demotic papyri have the left sheet under the right, so that the writing goes downhill at the joins (99 joins in all, detectable on both sides of the roll). Nearly all had distances between the joins of 13-18 cm., one had 21 and 22 cm, the last (damaged) may have had a [sheet] of 28 cm.' (letter of 21 vii 77). The importance of this point is that demotic writing runs from right to left. The sheet joins were in fact arranged by the manufacturer to facilitate writing 'downhill' across them.

He then carried out a re-examination of P. Lond. 604 (III pp. 70, 76; Atlas III Plates 24, 25; of A.D. 47). Under this number, 604 A and B, are published two separate Greek documents, each being several columns long and in several kolleseis. Some time after being written they were re-used, so that a romance in Demotic could be copied on the unused faces (now Brit. Mus. Egyptian Dept. EA 10822, 1 and 2). Mr. Pattie again takes up the story (letter of 2 viii 1977): 'Both Greek documents were written on the inside of the roll (vertical *kolleseis*, fibres perpendicular to the join, written "downhill" over the joins). Imagine the two Greek documents side by side, 604A on the right. 604A was turned over top to bottom, 604B was turned over side to side. The two pieces were joined right over left. Now on the right the beginning of the demotic romance is written downhill at the joints within the document, and at the join of the two documents, but on the left (604B verso) the demotic romance is concluded written "uphill" at the joins (left over right). On the recto the two Greek documents are upside down in relation to each other.

'The conclusion I draw is this: the manufacturer of the roll did not change his method for the convenience of Greek scribes. He continued to make the roll right sheet over left sheet for the convenience of demotic scribes. All a Greek scribe had to do was to rotate the roll through 180 degrees, and the joins were now "downhill" for him. What is significant in P. Lond. 604 is that the documents were joined so that they ran "downhill" for the demotic scribe. I make the further assumption that joins which do not fit this pattern were made in the scriptorium and not in the factory.

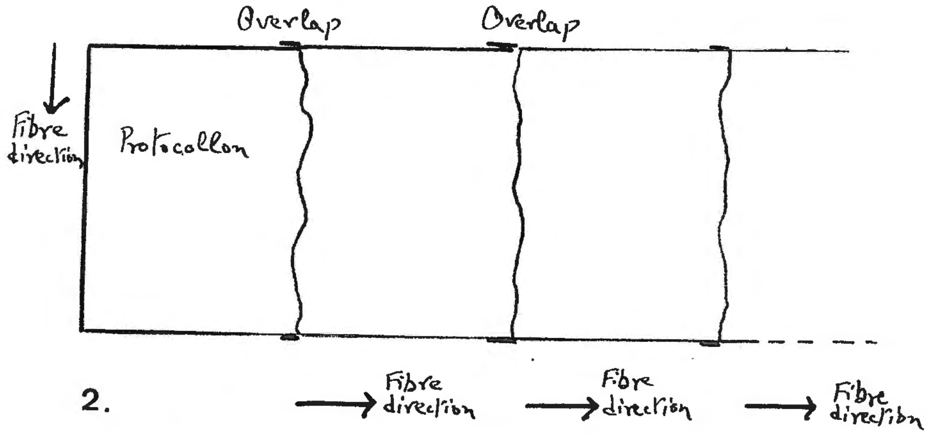
'There is an extra complication in P. Lond. 604, which may well not be relevant. At the join of the two Greek documents there is a trace of a third layer of papyrus, written in the same direction as 604B but not in the same hand or alinement. There are, I think, three letters in two lines, and it may be the remains of a piece of scrap used only to improve the join. I could see no sign of the additional sheet on the back.'

These observations of Mr. Pattie's seem to me to be of the highest importance, and his conclusion correct. It may be noted in passing that the existence of a habit of rotating a roll through 180 degrees so that writing shall go "downhill" renders vain the hope expressed by Mr. E. Lobel 1957 of making "absolute" the empirical rule that front ('recto') [the inside] is written first by arguing from the supposed rule adopted by the manufacturer.

3.4.6 Dr. John Rea has called my attention to a further possibility, which is susceptible of experimental testing, but which I have not so far been able so to test. Of a short piece of roll of the fourth century A.D. containing declarations of prices (P. Oxy. ined. 40 5B 110/B (5-6) a) he writes: 'There are two joins [*kolleseis*], and I notice something about them which is new to me. The paste seems to have been less effective than usual and the joins are beginning to come apart, which makes it possible to see that the two right hand sheet-edges which are preserved consist of horizontal fibres only for a width of c. 2.5 cm. The joins are fractionally wider, rather irregular, but say 2.75 cm. Could the sheets have been manufactured with these thinner edges, or were the vertical fibres stripped away afterwards when they were to be made into a roll? The resulting joins are, of course, less bulky than they would have been if there had been four layers of fibres instead of three. I wonder whether this was a regular practice? It would be worth setting up an experiment, using one of the techniques of separation set out by Wendelbo 1977, to separate a number of joins in safe places so that the thickness of the right hand edges could be investigated.'

On a future occasion I shall hope to be able to report the result of such an experimental investigation.

3.5.1 It has already been remarked (**3.3**) that special precautions were taken to protect the beginning of a roll. The very first sheet, called *protokollon*, normally not used as a writing surface, was turned back to front, so that its fibres ran vertically (see figure 2). It is not clear whether the manufacturer's practice was to start with a turned over sheet, or whether the protecting sheet was added subsequently. Two considerations favour the second alternative: (1) the protecting sheet may be less broad than its successors (P. Lond. III 1168, see below); (2) In BKT VI 55 the Festal Letter is composed of 20 sheets (Pliny's figure for a standard roll, cf. **3.3**.2) *without* the protokollon. The transverse fibres of this first throw-away sheet would effectively prevent the horizontal fibres of the first sheet carrying writing from coming adrift. Bell (1948) 7-8 supposes its function was to take the strain when the roll was being opened, and it would of course also fulfil this function. The Latin poets suggest that in a specially luxurious roll this first sheet might also be preceded by a leaf of parchment, and one example of this practice (see below) has survived in a document.



2.

There is an excellent example of a perfectly preserved *protokollon* dated A.D. 44 in P. Lond. III 1168 (pp. 135 ff.; Atlas plates 20-22). The roll is about 23.5 cm. high and 108.5 cm. long, and sets out in two broad columns the mortgage of a house and courtyard as security for a loan. The first column is preceded by a strip of papyrus about 8 cm. wide so attached that its fibres are at right angles to those of the main roll. On it is written a short note of 5 lines not transcribed by the editors and stated by them to have no connection with the main document. This statement is true if it means that this note is not a docket describing the document that follows. It does however concern the same persons and quantities as figure in that document.

Another of much later date and much damaged precedes the well known Paschal Letter of Alexander, Patriarch of Alexandria, P. Berlin P. 10677 = BKT VI 55 ff. (good plate of the letter in BKT Tafeln I and II; and also PGB No. 50. The protocol is not illustrated). This letter, 11 columns long, is written on a roll of 20 sheets 45 cm. H, 25 cm. B, preceded by a protecting leaf, on which the fibres on the inside of the roll run vertically. On the inside (i.e. the same side as the letter which follows) this leaf is covered by 9 lines in Greek and Arabic in the so-called 'vertical writing' normal in protocols from the fifth century onwards.

The protecting leaf of papyrus is itself strengthened by an additional strip of papyrus, itself reinforced at its left-hand side, that is the very beginning of the roll, by a strip of parchment. At a much earlier date a single letter from the chancery of the prefect of Egypt, the famous Berlin P. 11532 = PGB 35 (letter of Subatianus Aquila, A.D. 209) was itself protected on its left-hand side by a strip of parchment 5 cm. wide.

Another excellent example of a *protokollon*, as I believe, will shortly be discussed (**4.2**.2, P. Lond. III 1178).

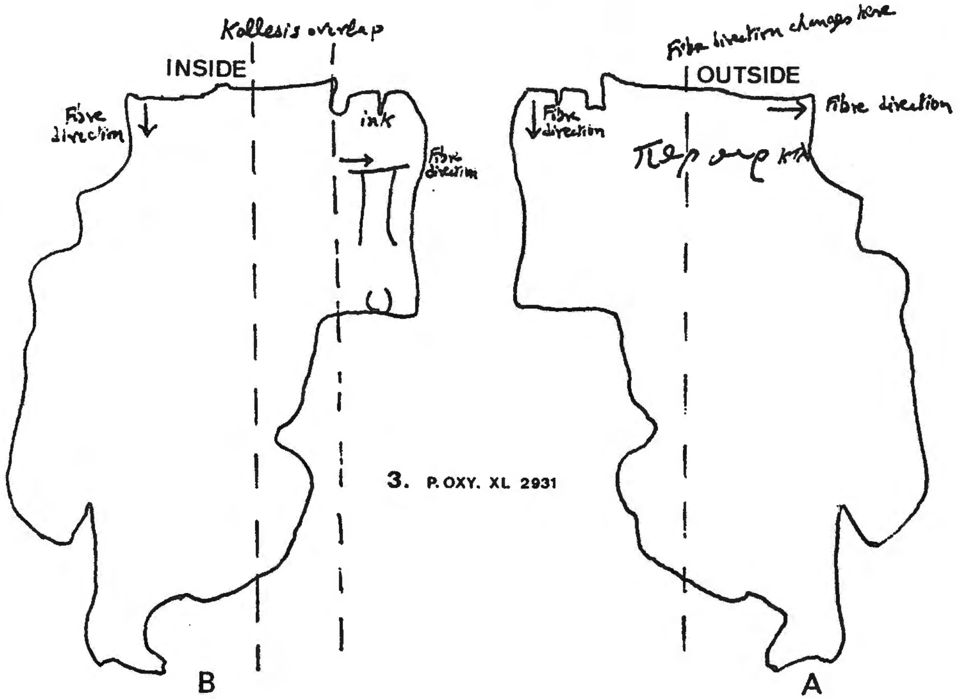
3.5.2 Perhaps a word should be said about this 'vertical writing'. 'It is known from Justinian, *Nov.* xliv 2, A.D. 536 that the notaries of Constantinople were required to use papyrus with the official protocol that bore inter alia the name of the *comes sacrarum largitionum* and the date of manufacture' (Lewis 1974 p. 122 n. 12, cf. p. 128). It is reasonable to expect some connection between this regulation and the 'perpendicular writing' found on surviving *protokolla*. They are found first in Greek and continue into the Arab era, always written on this first sheet of a roll and, like BKT VI 55, on the 'inside' of the roll (fibres always at a right angle with the following sheet, when that sheet survives). Those of the Arab period were deciphered first and found to contain 'the Mohammedan formulae, usually followed by the name of the Khalif or governor or both, in Greek and Arabic, and some illegible upright script (generally called 'perpendicular writing') which, it is now accepted, was for the scribes conventional and meaningless' wrote Bell and Hunt in 1924 (P. Oxy. XVI p. 209). P. Oxy. XVI 1928 offered the first example of a Greek protocol in perpendicular writing that was completely legible — 5 lines containing the name of Flavius Strategius, his office, the name of his scriniarius and the date. This writing (with the fibres) completely fills a large sheet of papyrus 30 cm. wide and 21.5 cm. high. The sheet is now detached from the roll to which, turned back to front, it served as protocol. Its back was subsequently used for a copy of the 90th Psalm intended for use as an amulet, written in 16 lines across the fibres.

The curious student will observe an interesting contradiction in the editorial description. In the introduction the protocol 'perpendicular writing' is called the 'verso'; in the labelling of the plate and the transcription this same side is called the 'recto'.

3.5.3 Since in Latin the term *eschatocollion* exists (Martial 2.6.3), and the word is clearly formed from the Greek, I should be inclined to suppose that a roll normally ended also with a spare sheet turned back to front before pasting to block fraying of horizontal fibres of the penultimate sheet. If there is validity in the point made under **3.4**.5 (that the Egyptian roll was originally structured for Demotic scribes, and that Greek scribes rotated it through 180 degrees), one would certainly expect similar protection at the end of the roll. But I have not observed any actual examples. Perhaps others may be able to find them.

3.5.4 Discussion of *protokolla* and *eschatokollia* is not of mere academic interest to the practising papyrologist. In dealing with small fragments he may find himself faced with apparently anomalous sheet-joins. It is possible that they can be explained as the join of the *protokollon* or the hypothetical *eschatokollion*. This explanation has recently been put forward by Dr. John Rea for C.P.R. V no. 21, (c. IV) and P. Oxy. XL 2931.

3.5.5 The Rainer papyrus is a straightforward case; not so P. Oxy. XL 2931. I believe the explanation of these two joined but fragmentary sheets as part of a protocol of a roll is correct. But it is not easy to judge with certainty which side was originally the inside of the roll, and which the outside. If XL 2931 was the inside [A in Figure 3], then the published document is the heading to a succession of (now lost) subsequent entries, while the writing on the back is a title of the same type as appears on the back of XL 2930; if XL 2931 is on the outside, then



3. P. OXY. XL 2931

no writing can have followed, i.e. the published text is a *pro forma* only. What can be read on the other side to XL 2931 [B in Figure 3] consists of parts of 3 lines written in enormously tall letters.

. . .
. [
(*vac.*) [
π [
. [Top of either β or ϱ
. . .

I have been able to inspect the original of this text at leisure and to argue over it with Dr. Rea. I have also had the benefit of observations made by Mr. P. J. Parsons and Dr. W. E. H. Cockle.

There is no doubt that the fibres of the two successive sheets run in different directions. The overlap of the kollesis join is about 2 cm. wide. Since the writing on either side is the same way up, whichever side is uppermost, the sheet on the left must necessarily have had vertical fibres and overlaid its successor, which therefore had horizontal fibres (when the piece is turned back to front, what was previously on the right occupies the left hand position). The following distinctions may be noted in the physical features of the papyrus:
(a) If the three lines .[, π[, .[(B in Figure 3) are taken to be the inside of the roll, the line of junction between the two sheets is clear and well-defined, and the writing is restricted to the sheet that has horizontal fibres (→); (b) we note that in the text published as P. Oxy. XL 2931, the line of junction of the kollesis is less well defined in the converse position, and the writing runs partly on vertical, partly on horizontal fibres — i.e. it runs over the kollesis. Taken in conjunction with the fact that there is empty papyrus below the writing of XL 2931, these observations suggest to me that it is on the outside of the roll. But I admit their fragility, and the desirability of awaiting additional evidence.

3.6 The statement made in **3.3** and repeated in **3.4.1** that kolleseis are always down the height of the roll and on its inside perpendicular to the horizontal fibres is, I believe, true as a rule. But it is possible that mistakes might be made by the manufacturer, and I should be glad to learn of any. Some examples are put forward by Grenfell and Hunt (Grenfell and Hunt 1897 p. 213). They say: 'P. Petrie II xxix b (Bodl. MS c. 18 P = P. Petrie III 104) is a case in point. Two sheets are joined in such a way that in one case the recto, in the other the verso is uppermost'. I have not examined this text.

P. Grenfell II 42 = P. Lond. 700 is an official letter in Greek written in A.D. 86. The editors correctly say that 'the writing is on the vertical fibres of the recto', for a horizontal kollesis can be seen running right across the text (now c. 17 cm. B, probably only a half of its original breadth, 14 cm. H) between lines 4 and 5.

It is quite likely that no one of these examples is a true exception to the general rule, and that they were sheets joined casually.

3.7 The account in **3.4** is compatible with the little that is known of ancient Greek terminology. Scribes seem to have used ἔσω for what was written on the inside of the roll (Wilcken's recto), ἔξω or ὀπίσω for what was written on the back of the roll. The evidence is collected in *G.M.A.W.* p. 16 n. 4 (to which should be added ὀπίσω in Hercul. Pap. 1021 at col. 2.35, Herculanensium volumina coll. altera I 162-197).

It would therefore be entirely sensible and unambiguous to use the term 'inside' or 'interior' for the writing on the inside of a roll. This terminology has been proposed by A. Bataille and H. Cadell (1966 p. viii): 'plat intérieur', 'plat extérieur'.

3.8 Theodor Birt's examination of artistic representations of the ancient book roll (Birt 1907) also supported the description of the Graeco-Roman papyrus roll set out in **3.3** and **3.4**. With five exceptions, the roll is so arranged (whether it is lying on the reader's lap, turned-back on itself in the reading position, or held with one portion in either hand) that it forms a horizontal band across the reader's vision or writer's posture. This is the case as early as the representations of the famous 4th and 5th dynasty scribes from Saqqara in Cairo, Paris, Leiden and elsewhere (I take this opportunity to remark that the Louvre scribe, Louvre 2962, is not represented in the act of writing, as is often stated — he holds no rush or palette, and is staring into the middle distance). In Greek and Roman art, starting from Greek vases, Athenian grave-stelae, the roll as a horizontal band is normal. The reader's eye will be travelling down the columns of writing, his left hand will roll up what he has already read, and his right will unroll the as yet unread text. The five apparent exceptions appear on Athenian vases (four of them in Beazley 1948 pp. 336 ff, add ARV^2 1670; most of them in greater detail in Immerwahr 1964 pp. 18 ff., cf. also Immerwahr 1973). In these five the writing runs transversely across the height (see above **3.3.3**) of the roll. It is generally agreed that this is an artist's convention to allow the person admiring the vase to glimpse the contents of the roll. This seems likely enough, since there are at least two fifth century vases (Athens 1241 and 1260) which suggest that the writing on them was carried in the normal columns; and the earliest surviving Greek literary papyri (Berlin Timotheos, Derveni Commentary, cf. **4.5.2**) — admittedly a century later in date at least — also carry their writing in columns in the expected manner. Still, in view of what we shall see in a moment, these exceptions need to be recorded.

4

TRANSVERSA CHARTA: SORTING OUT THE CONFUSION

(1) Confusion caused by use of terms in sense **2** or sense **3**.

(2) Greatest misunderstanding: failure to note existence of rolls which stretch vertically, not horizontally (rotuli): e.g. P. Lond. 1178, P. Lond. 229, P. Oxy. 2851.

(3) = writing *transversa charta*. Roll is rotated through 90 degrees, fibres run vertically on inside, *kolleseis* are horizontal, and writing is parallel to them, usually from edge to edge.

(4)-(9) Usage of rolls written *transversa charta*: always documentary in antiquity. Ptolemaic practice (Elephantine double documents) an offshoot of Pharaonic and parent of Roman practice. Double documents drawn up according to Roman law always *transversa charta*. List.

(10)-(11) Some questions of scribal practice.

(12)-(15) Link with Byzantine usage: rotuli from Kom Ishgau, Syene, Ravenna, Papal Diplomata, Liturgical and Exultet Rolls.

(16) Vindolanda Tablets comparable with rotuli, not codices.

4.1 Section **2** has traced the use of the terms 'recto' and 'verso' defined by the content of the texts they carry; section **3** the use of these same terms defined by the physical properties of papyrus as a material. It would be surprising if confusions had not resulted from these different modes of definition. Indeed they have. They have come to light first in regard to the make-up of papyrus codices. A number of examples of the confusion wrought by terminology in the study of papyrus codices has been provided by J. van Haelst (van Haelst 1961, 1969). I need therefore offer only one example here. But it is an instructive example, for it is of an error made by the experienced papyrologist and palaeographer Victor Martin in his reconstruction of the pages of the composite Bodmer papyrus codex containing the *Apology of Phileas* (P. Bodmer XX). Pages [129-144] of this work are demonstrably to be reassembled as part of a single gathering, in fact a normal quaternio, a gathering of 4 sheets, 8 leaves. In it the fibres of pages 1 [= 129], 3, 5 and 7 run vertically and 2, 4 and 6 horizontally; the fibres of pages 8 and 9 are both horizontal. These two pages are therefore the centre of the gathering. Thereafter pages 11, 13 and 15 show horizontal fibres, pages 10, 12, 14, 16 vertical fibres. The text of *The Apology of Phileas* continues on one further page [p. 145]; on the back of this leaf a new text begins. Martin argued that this leaf was also part of the same gathering, which he therefore supposed to be a gathering in 'fives', a quinio. His argument was based on the expectation of a regular alternation of horizontal/vertical fibres in the pages of the second half of the gathering, and by the statement that this last page [p. 145] of the

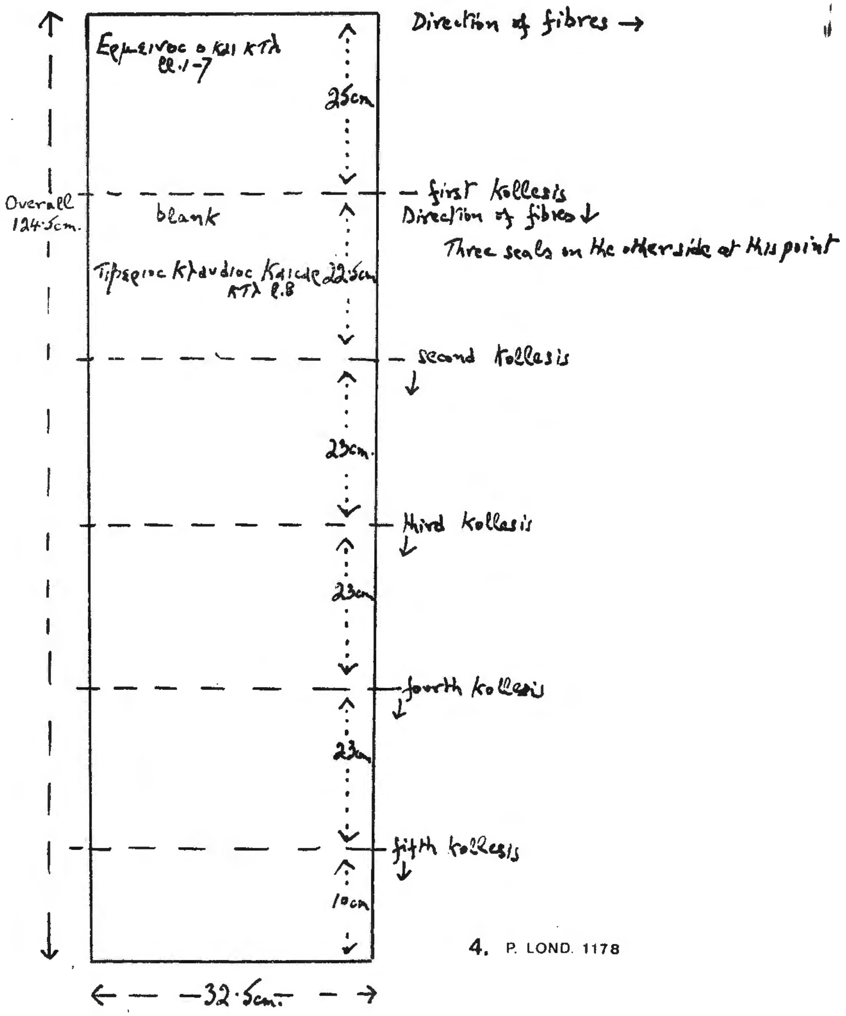
Apology shows horizontal fibres. Now this page is a 'recto' page in sense **2.3**, viz. it is a right-hand page; but observation shows that it does not have horizontal fibres but vertical ones. Martin's report that it is on the plat 'recto' of what he numbers folio 9 is simply an error, as can be observed from the facsimile on p. 17 of *ed. princeps* and as I have verified on the original. The last page of the *Apology* is therefore written on the first page of a new gathering, and the previous gathering was a quaternio, a regular gathering of 'fours'. You will have observed that Martin here used the phrase 'plat recto'; usually in this volume he uses Bataille's more precise terminology 'perfibral', 'transfibral'. I account for Martin's error myself by the supposition that his wish to find a right-hand page, 'plat recto' [sense **2.3**], has cheated his powers of observation of the actual fibre direction, and that he equated 'plat recto' with 'plat perfibral'. Alternatively we may postulate an unconscious influence exerted by M. Testuz. In writing in P. Bodmer VII-IX p. 73 of the text that immediately follows, viz. Psalm 33, Testuz states: 'le psaume 33 commence au verso du premier feuillet' (verso in sense **2.1**, **2.2**). (Schwartz 1965 p. 440 has noticed the same error but based no deductions on it; in Turner 1977 p. 79 I set out the matter at length, for it has an important bearing on the make-up of the whole of this composite codex.)

4.2.1 This is not meant as a castigation of Victor Martin. For I have myself made a more serious error, through a similar confusion of senses **2** and **3**. It is an error concerning rolls, not codices. It is my complete failure in *Greek Papyri* (Turner 1968) to mention the existence of papyrus rolls which were written and held to be read vertically in relation to the reader, not horizontally (as in **3.8** above). Such a roll was read downwards from top to bottom; and its lines ran at right angles to the long axis of the roll. For first calling my attention to this omission I am indebted to Dr. John Rea (Rea 1971). Almost at the same time I received a draft of a paper later published by Professor Lloyd Daly (Daly 1972), afterwards followed by a more detailed analysis (Daly 1973) treating the general question involved.

In the ninth and tenth centuries after Christ the classic form of this roll is that of the three Greek liturgies; a specialized form is the liturgical *Exultet* roll (Avery 1936; G. Cavallo 1973).

In the absence of a generally accepted term for a roll held in the vertical position to be read, I shall here employ the word 'rotulus' for it, following Lloyd Daly's lead. (H.I. Bell, David Crawford and Dr. Sijpesteijn, I observe, use the phrase 'rolled from the bottom upwards'.) That rolls of this kind existed in antiquity is beyond doubt. I shall begin with three examples from the Roman period, since these have somehow escaped general attention; and because their very existence poses most sharply the purpose as well as origin of this format.

4.2.2 I shall take as first example (it is not the oldest available) the Boxer's "Diploma" in the British Museum, Brit. Mus. Pap. 1178 (III pp. 214 ff., Atlas III 40-43) = Wilcken, *Chr.* 156 of A.D. 194. This roll, which measures 124.5 cm. along its long axis and contains 102 lines of writing, is now divided between three glass frames ; the second and third frames are mounted on card so that the back can not be inspected, but the first frame has recently been remounted to display the 'seals' on the back. Its original make-up will be best understood from a diagram (Figure 4) :



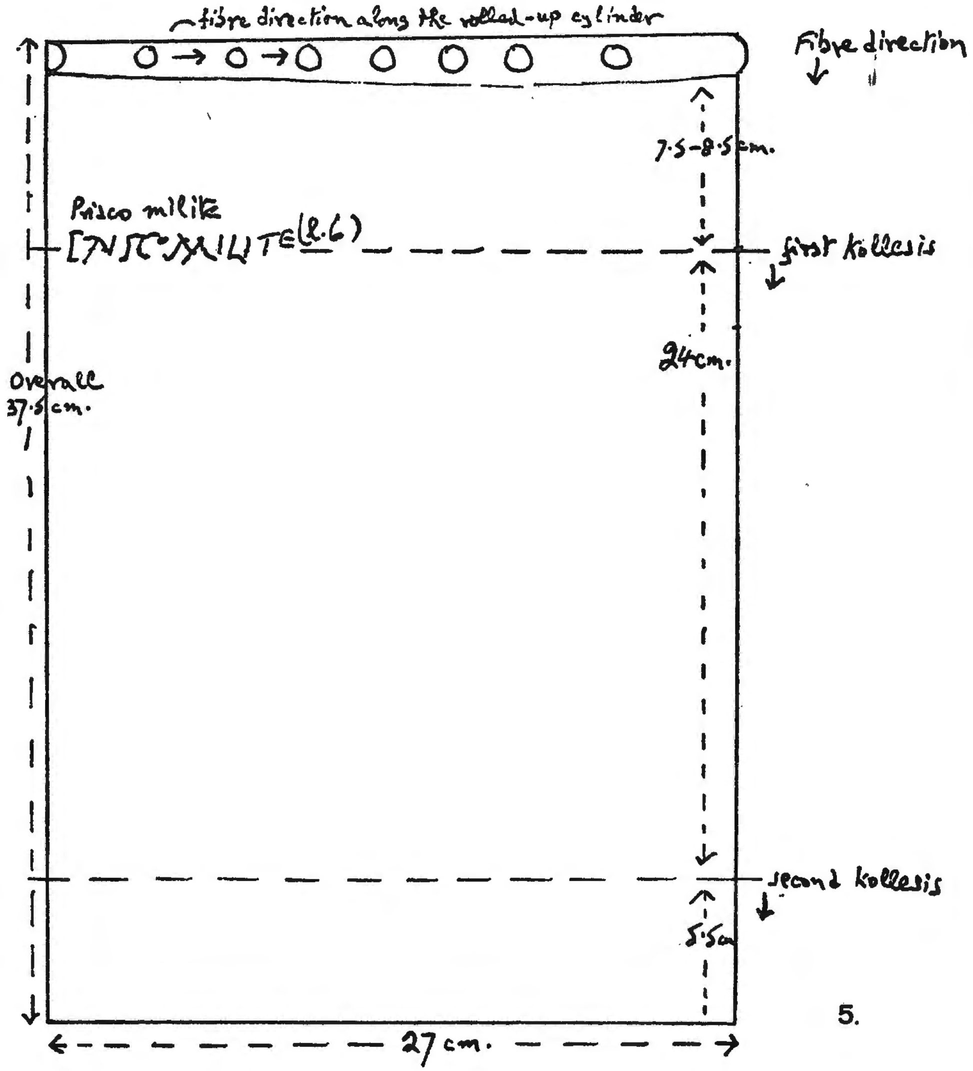
4. P. LOND. 1178

This "diploma" was written at Naples in Italy. It was clearly meant to be held vertically in front of the reader's eyes. Each of its 102 lines runs horizontally from one edge of the papyrus to the other ; in sheets 2-6 the lines are at a right angle to the fibres ; and the kolleseis are also horizontal when the papyrus is so held, with the result that the fibre-direction is perpendicular in relation to them. It will be seen that a 'rotulus' of this type is in fact nothing other than the normal roll, already examined in **3.3**, rotated through 90 degrees, and then cut when the required content had been accommodated. This one is formed of five sheets, each about 22/25 cms. in width and 32.5 cms. high, and a portion of a sixth sheet. I find it easiest to account for the difference of fibre direction displayed in the first sheet by assuming it to be the *protokollon*, which as has already been seen (**3.5**) is normally attached to the roll with its fibres perpendicular to the fibre-direction found in the following sheets, and which on occasion is made an integral part of the roll concerned. The original editors spoke of it as forming a 'docket' (their note does not make it clear whether they considered it was part of the original roll, or was added subsequently). Wilcken (*Chr.* l.c.), Viereck (1908) and Gerstinger (1954 (1) and (2)) all speak of it as a sheet subsequently stuck on ('angeklebtes Blatt'). I should dispute their conclusion for the following reason : In the middle of the second sheet and on its back there are "three formless lumps of dark wax". They come at a point before the main body of the document (l. 8) begins, but well below the 7 introductory lines. These lines, though drafted in epistolary form, seem to me to have the effect of the 'inner writing' (scriptura interior) of a double document. The 'formless lumps of dark wax' are vestigial sealings, a survival of the practice of sealing up an inner writing, even though no names are written against them. They come at exactly the point in the roll where sheet 1, if rolled into a cylinder, would need to be sealed down. If this suggestion is near the truth, then the original editors who used the word 'diploma' for this text apparently simply as an inspired description of the nature of the text (a certificate of membership of an athletic club) may well have hit the mark also in the etymological and diplomatic use of the term 'diploma' meaning a double-document (cf. its use in BGU III 913.3 εἰς τόδε τὸ δίπλωμα). It is to be noted that no Greek word in the contents (e.g. διπλῆ as in BGU IV 1074 or P. Oxy. XXVII 2475, 2476) authorizes the term 'diploma'. This point will be taken up again at **4.8**.2 and **4.9**.

In passing I should note that Viereck 1908 p. 414 is simply wrong in treating this papyrus as a copy, for the handwritings of the witnesses are all autographs.

In describing this text the editors were careful to note the direction of the fibres and the sheets and careful not to use the words 'recto' and 'verso'. There is, therefore, no excuse for the neglect of its contribution to ancient diplomatic.

4.2.3 Such an excuse could however be made for the failure to appreciate the true nature of an even earlier 'rotulus'. This is the famous Latin Slave Sale written at Seleucia in Pieria in A.D. 166, P. Brit. Mus. 229 (I p. xxi ; ed. princeps E. Maunde Thompson, *Archaeologia* LIV (1895) 433-438 ; often repeated, full bibliography in Ch.L.A. III no. 200). I give a diagrammatic representation in Figure 5 : —



5.

It will be observed that a portion of the uppermost sheet has been rolled over to form a cylinder, the fibres of which are the fibres of the back, because they run horizontally. This cylinder was fastened down by a series of triple 'threads' of papyrus and sealed with seven seals. The dimension of papyrus rolled over cannot have amounted to more than 6 cm. In fact it has never been opened. Analogy (from Dura-Europus — see **4.8.2** — and elsewhere) suggests that it may have contained in summary form an epitome of the contract that follows (full discussion in Marichal Ch.L.A. l.c.). However, the larger end was prised open as far as possible in the 1950's, but no trace of writing appeared.

In neither the ed. princeps nor in P. Lond. I p. xxi is there any statement about the fibre directions, or the kolleseis of the sheets of which this sale is composed. *The Written Word on Papyrus* (Pattie and Turner 1974) mistakenly gives the fibre direction as →. This is a wrong inference from R. Marichal's statement in Ch.L.A. III no. 200 'written on recto'. Marichal's statement is not incorrect. It is true in the sense of 'recto' as defined in **2.1** and **2.2** above ; it is even true in sense **3**, since the kolleseis show that this is the inside of the roll. But the use of the term 'recto' in the case of this text has effectively concealed the fact that it is a 'rotulus', held vertically in relation to the reader. All three sheets of which it is composed undoubtedly show perpendicular fibres, the writing is at a right angle to them, horizontally across the roll, and the kolleseis are horizontal, proving 90° rotation.

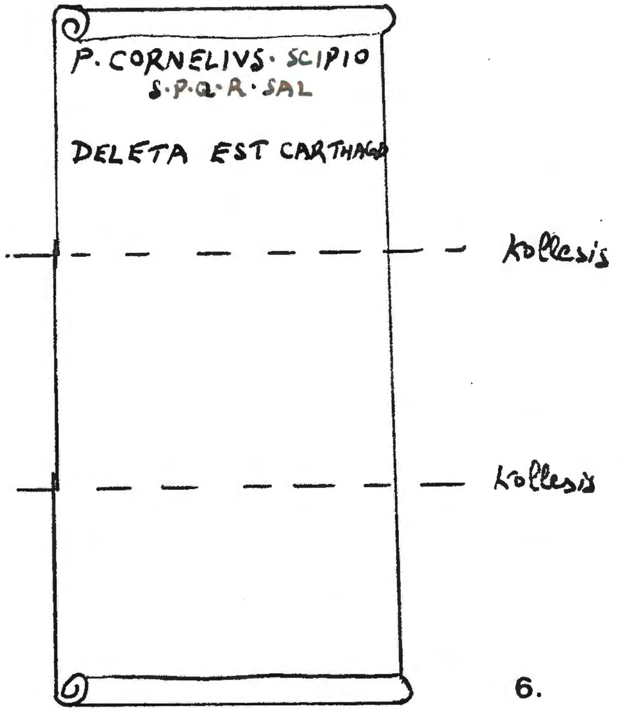
4.2.4 A third text of the same type, again a sale of a slave written in Latin in a military milieu (the *hiberna* of legio II Traiana fortis) should be mentioned here. It is P. Oxy. XLI 2951, dated A.D. 267, edited in 1972 by G. M. Browne. It also is a 'rotulus' in the sense here defined, consisting of at least 4 sheets, of which the fibres run in a vertical direction. The document is damaged at the top, from which almost a whole sheet has been lost. This point should be stressed, for it is quite possible that this text, like the preceding, was a 'double-document', preceded by a rolled up, sealed copy or summary of what follows. Its present size is 25.5 cm. B × 53.5 cm. H. The first horizontal kollesis runs through l. 3 (some 3 cm. from the present top) ; the distance to the next kollesis is 17.5 cm. (running through l. 13), to the third 18 cm. (running through l. 25 and near the top of l. 26). A further 15 cm. of a fourth sheet survives. The diplomatic peculiarity of this text has not been specifically commented on by the editor. He writes : 'the papyrus is written across the fibres', he places a vertical arrow at the beginning of the text, and says 'subsequently the verso [i.e. in the sense of my § **2** above] was used for a list of names'.

4.3.1 In discussing the Boxer's Diploma (**4.2.2**) I wrote that the 'rotulus' is a normal roll rotated through ninety degrees. This is precisely the meaning of the phrase 'transversa charta' — a phrase which occurs only once in Latin, namely in Suetonius *div. Jul.* 56.6 describing Julius Caesar's despatches to the Senate. 'Epistulae quoque eius ad senatum extant, quas primum videtur ad paginas et formam memorialis libelli convertisse, cum antea consules et duces non nisi transversa charta scriptas mitterent'. The ablative 'transversa charta', "the roll having been rotated through ninety degrees", is of the same linguistic pattern as 'aversa charta' ("the roll having been turned over") noted in Martial (section **2.1** above). Lewis and Short's Latin Dictionary is less precise than my needs require in giving meanings for *transversus*: 'turned across', hence 'going or lying across, athwart, cross-wise; cross-, transverse, traverse'. Such definitions could apply to diagonal or 45 -degree rotation as well as ninety-degree rotation (indeed 'ex transverso', Plaut. Ps. 4.1.57 is translated 'obliquely'). In response to an appeal for help my colleague Otto Skutsch has laid it down firmly that 'transversa' here means 'through ninety degrees', and refers to his interpretation of Ennius' words 'traversa mente': 'traversus regularly denotes a movement at right angles to another' (Skutsch 1968 p. 171). Mr. T. C. Skeat calls my attention to Cicero ad Att. V 1.3 'nunc venio ad transversum illud extremae epistulae tuae versiculum', that is, a postscript written in customary fashion up the side of the letter (quoted by Peter 1901 p. 31). Cf. also Pliny's opposition n.h. xiii 77 of 'in rectum' with 'transversa' (traversa). The type of despatch superseded by Julius Caesar was in fact a 'rotulus' as described in **4.2.** What was the nature of his innovation it is not my purpose to enquire here: one suggestion is made by Roberts 1933; another (which I am inclined to prefer) by Kenyon 1951 p. 57 n. 1. It has also been discussed by Vergote 1946.

4.3.2 In making this suggestion I do not think I am proposing anything startlingly new. The essentials of this interpretation are present in Peter 1901 and in Wilcken 1891 and 1912. In the latter (*Gdz.* xlvii) Wilcken wrote 'if the writing is parallel to the height [i.e. of each individual sheet, 'parallel der Paginahöhe'] (transversa charta) it is not in a number of columns but in a single column, which is as broad as the height of the sheet, as broad as the text requires'. In 1913 p. 202 he repeated his definition.

Wilcken has seen the truth, but his expression is complicated (and therefore failed to carry conviction with many) because he interprets 'charta' in the phrase 'transversa charta' as the single sheet of papyrus which is the basic element in the papyrus roll (he 'saw the skull beneath the skin'). Since N. Lewis in 1934 demonstrated that χάρτης, *charta*, means a papyrus roll, the meaning of the phrase is transparent. I could only wish that Lewis himself had drawn this further conclusion from his first brilliant re-interpretation. Forty years of error could have been avoided. For this reason I have set out the matter in some detail in **4.3.1.** After writing it I see that Černý in 1952 drew the same conclusion.

4.3.3 In passing I should observe that the explanations of this passage given by E. Maunde Thompson in *An Introduction to Greek and Latin Palaeography* and by Sir Frederic Kenyon (both cited by Butler and Cary 1927 p. 120) are rendered unintelligible through the ambiguities inherent in the terms 'parallel with the height of the roll', 'all across the width of the papyrus'. How I understand the meaning of 'transversa charta' should be put beyond doubt by Figure 6. Just possibly this is in fact the meaning they both intended. As it stands, the note is an irresponsible one and has done much mischief.



6.

4.4.1 If I have carried conviction on this point, then we have traced the 'rotulus' back to Republican Rome, and established that it was employed for despatches to the Senate down to the time of Julius Caesar.

This should suggest the utility of first looking further backwards in time before tracing the later development of the 'rotulus', or speculating on the reasons for its employment.

4.4.2 It should, however, be explicitly noted that I have found no example of a 'rotulus' used for a work of literature in Greco-Roman antiquity. The purpose is always documentary. Černý (1952 p. 22) has made the same observation for Pharaonic Egypt. When he is confident that a given hieratic or demotic text is in 'rotulus' form, *transversa charta*, then he is also confident that the text is a document.

4.5.1 The first stage in tracing the antecedents of Roman usage is to examine the diplomatic usage of Hellenistic Egypt.

In 1921 Wilhelm Schubart (Schubart 1921 p. 11) wrote that 'the earliest surviving papyrus documents in the Greek language show the rule [i.e. that 'recto' — **3.2-4** — was written before 'verso'] only in process of formation'. This observation is of interest if we interpret 'recto' as 'written on the inside of the roll across the fibres *transversa charta*'. The following documents of the very earliest period exemplify this mode of writing:

(a) Saqqara papyrus of Peukestas, 330 B.C. (Turner 1974).
Written with a rush. A strip of 13.4 cm. cut from a roll 36 cm. high.
(b) Marriage contract of 311 B.C., P. Elephantine 1.
(the edition gives the height of this text as 40 cm., breadth 35 cm. No mention is made of any kolleseis, of which I should have expected at least one. The contract is a 'double-document', which may itself be a reason for its diplomatic form. See below **4.8**.2.)
(c) Will, P. Elephantine 2, '40th year of Ptolemy' = 284 B.C.
4 'selides' are mentioned (I presume this means there are three horizontal kolleseis).
(d) Contract for nursing, P. Elephantine 3, 283 B.C.
(e) Contract for nursing, P. Elephantine 4, 283 B.C.
(The editor makes no statement about fibre direction. I suppose these two texts to be 'across the fibres *transversa charta*' because their height is given as 28 cm., breadth as 42 cm.)
(f) Accounts, probably of 4th century B.C., found at Saqqara (Turner 1975)
Written with a rush?

Speculation as to why these documents are written in this manner must wait. At the moment we must reject categorically Schubart's explanations that the vertical fibres were an obstacle to a sharpened pen, all previous writing having been with a soft rush, and that 'the [recto/verso] rule was in process of formation' (*ibid.* p. 10-11). Nothing intrinsic to the papyrus material caused them to be written in this way: for contemporary literary texts in Greek written with a pen are not written across the fibres.

4.5.2 Of such I list five:

(a) The Timotheos roll, P. Berlin 9875.
(If I can trust the photograph in PGB No. 1, I can see a clear vertical kollesis; and can identify the fibre surface as at right-angles to it.)
(b) The 'Prayer of Artemisia', UPZ I 1. Wilcken l.c. p. 98 (= 1927 p. 98) suspects it (against Wessely's statement to the contrary) of being written in the expected way along the fibres. I can confirm from autopsy that Wilcken's suspicion is correct.
(c) The Derveni roll, GMAW No. 51.
(I can only judge from photographs, and would welcome confirmation from inspection.)
(d) The Elephantine scolia, BKT V 2, xv p. 56, plate in PGB No. 3, c. 300 B.C.
(I base my assertion on the plate in PGB. BKT makes no statement.)
(e) P. Saqqara (Handley - Turner 1976), of about the same date.

4.5.3 Certainly by the middle of the third century B.C. many documents are written along the fibres, and the roll is normally 'horizontal' (kolleseis are vertical). I need quote only the Revenue Laws Papyrus in support of this statement.

But much writing continues to be 'across the fibres probably *transversa charta*'. In the Zenon archive this seems to be particularly the case with letters in chancery-type hands, to or from Apollonius or members of his circle. A striking example is P. Lond. VII 1954 (P. Lond. inv. 2090), a letter of 257 B.C. (very close in content to a petition) addressed to Apollonius himself by a body of farmers. It is 14.0 cm. high, 42.5 cm. wide — and the measurements of themselves suggest that it was cut from a roll 42.5 cm. high and then rotated through 90 degrees.

Mr. Skeat adds that the two contrasted methods of letter writing are clearly explained by C. C. Edgar (1931, pp. 58-60). Edgar points out that letters from Apollonius' chancery are usually long-lined letters, i.e. across the fibres. Mr. Skeat continues: 'Apart from this I think correspondents used both types indiscriminately, though possibly the short-lined letter was regarded as less formal. Incidentally P. Mich. Zen. 84 (Plate VI) is a good example of *transversa charta*.'

4.5.4 Many more examples of this usage could be put forward. One type in particular is well-known. Petitions ('Enteuxeis') for redress addressed to the king in person are regularly written in this diplomatic form in the third century B.C. Octave Guéraud (Guéraud 1931) has analysed the diplomatic of the 84 petitions of this type published or republished by him. Only 2 of them (Nos. 1 and 84) fail to obey this 'rule', that they are 'written perpendicular to the fibres *on the recto of the papyrus*' (Guéraud's terms — I should prefer to say *transversa charta*). The greatest width found in the *enteuxeis* published by Guéraud is 34 cm., the least width is 30.5 cm. — "the tallest rolls available in the villages in which they were written". On two of Guéraud's plates (e.g. Plate II, no. 8; Plate VIII no. 65) a clear horizontal kollesis is visible, proving the rotation of that roll through ninety degrees for those examples.

I should emphasize the word 'regularly'. Guéraud has himself noted two exceptions in his own collection of material, and draws attention to others. For a recent example from the Zenon archive of an exception P. Lond. VII 2039 could be quoted, and examples need not be multiplied. In the second century the custom is still revived intermittently (e.g. P. Lond. I 44 p. 33 = UPZ I 8, which has a clear horizontal kollesis 5.5 cm. from its foot). But there are by this time at least as many examples quotable of petitions of this type written along the fibres, with vertical kolleseis.

4.6 There is in fact an Egyptian paradigm for writing on rolls (or sheets cut from a roll) across the fibres *transversa charta*, and it is described by Černý 1952 pp. 21-22. 'We must now proceed to investigate why in a number of papyri containing letters, reports and legal documents, the front — by which we mean the side on which the text starts — is found written on fibres running vertically. At first sight it would seem that such documents were begun by the scribe on the outside of the roll (vertical fibres), then cut off and finished on the inside. Fortunately, the true proceeding is revealed by such of these documents as show the joins; these always run parallel with the lines, that is at right angles to the vertical fibres.' Černý knows 'of no document written in this way earlier than the second half of the XVIIIth Dynasty [four legal papyri from Kahun, two at University College London and two in Berlin, P. 9784 and 9785, from year 27 and 33 of Amenophis III and year 4 of Amenophis IV]. The Old Kingdom and Middle Kingdom letters all begin on the horizontal fibres, that is they are written like a literary text on a roll placed horizontally... But after Amenophis the other way of writing becomes quite common'.

No doubt therefore this way of writing the roll/separate documents was taken over into Greek usage direct from contemporary Egyptian practice. T. C. Skeat suggests that it may have been normal usage in the Greek world even before Alexander.

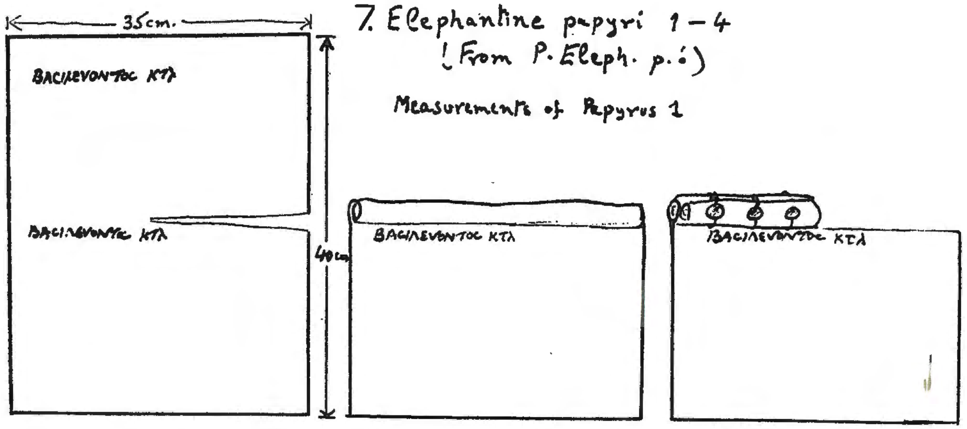
4.7 This inference is the more reasonable in that Aramaic administrative practice seems to have frequently used the papyrus roll/cut pieces in the same way as Černý describes Egyptian usage from the XVIIIth Dynasty onwards. In the publication of the *Brooklyn Museum Aramaic Papyri* (found at Elephantine), John D. Cooney (Kraeling 1953) writes p. 127: 'Contrary to the practice of their Egyptian neighbors, the scribes of these Aramaic papyri wrote their texts in most cases on the verso, leaving the recto unused except for the customary one-line endorsement. Again differing with Egyptian practice, which was to write texts in columns along the length of a papyrus, our Aramaic papyri are inscribed in a single column running across the width of the papyrus'. Cooney is using 'recto' and 'verso' strictly in my sense **3.2-4**. Plate III of a roll (= papyrus 3) of 437 B.C. dealing with the grant of possession of a house shows that the text there is in fact 'written *transversa charta*', and the presence of three horizontal kolleseis suggests that the roll was like that described by Černý for contemporary Egyptian practice. I cannot say for certain from the photograph whether the fibres are perpendicular to the sheet-join; but the roll is held vertically. This roll is 30.1 cm. broad (measured along the kolleseis) and consists of 4 sheets of a total of 80.8 cm. length.

The case is clearer in papyrus 2, a marriage document of 449 B.C. Plate II shows a roll 26.5 cm. high, 32.3 cm. broad; the visible kollesis runs horizontally across the width of the roll, and the fibres are undoubtedly at a right angle to this kollesis.

4.8.1 When I first began to observe examples of 'rotuli' I was inclined to seek the reason for choice of this format in the desire to imitate royal chancery practice. The three Roman examples (a diploma of a guild under imperial protection, two slave sales in Latin both in a Roman army milieu, Roman Republican consular letters written 'transversa charta'), the later Papal and royal diplomata, the Ptolemaic set format of the third century B.C. for 'enteuxeis' to the king, Aramaic administrative documents seemed to point in this direction. A similar suggestion was put forward by Vergote 1946. But there are too many exceptions to the practice for the explanation to hold. The Ptolemaic royal letter with autograph fiat of Ptolemy Alexander (P. Leiden 'G' = UPZ I 106) of 99 B.C., the order of Subatianus Aquila for release of a prisoner from the alabaster quarries (A.D. 209, PGB No. 35) are not written *transversa charta*. Nor are the Latin rescripts of Diocletian and Maximian (P. Leipzig 44; Écriture Latine nos. 32 and 33), Abinnaeus' petition to the Roman emperors of A.D. 338 (P. Lond. 447 = P. Abinn. 1; though not actually presented because it was reworded, it was set out in due form for presentation), or the imperial rescripts of the fifth century after Christ preserved partly in Paris, partly in Leiden (e.g. P. Paris I, II; P. Leiden A, B, C. I cite these papyrus texts by the inventory numbers on the frames in which they are mounted. The form of reference is not to what is ordinarily meant by P. Paris 1, P. Leiden A. Cf. Santifaller 1953, 53).

4.8.2 A more promising approach, which will at least account satisfactorily for the three Roman examples, is that they conserve a traditional practice of writing *diplomata* (double-documents) transversa charta across the fibres.

We have noted (**4.5**) that this was the way four early Ptolemaic contracts from Elephantine were written. Their editor offers the following diagram of their form (Figure 7):



7. Elephantine papyri 1–4
(From P. Eleph. p. i)

Measurements of Papyrus 1

Those double-documents of the Roman period found at Doura-Europus were written in the same way with the same horizontal nick cut across the material if they were copied *on parchment* (but not if they were written on papyrus) (see P. Dura p. 14; Nos. 18 and 31 are examples).

Was there then continuity between Elephantine and Roman Doura? There was certainly not such continuity in Ptolemaic Hellenistic practice. In the 2nd century B.C. double-documents in Egypt (just like 'enteuxeis') cease to be written *transversa charta* across the fibres. We may take a single example to stand for many: P. Haun. 11 of 183/2 B.C. (date from Zauzich 1969). It is a receipt for a payment to the Idios Logos. It is written in the horizontal position, writing being along the fibres, and there are 9 kolleseis vertically down the roll 16.5 cm. apart. The 'inner text', sealed by a single seal, is at the left of the 'outer' text, i.e. is the first sheet of the roll. Its contents give a bare summary in 4 short lines of the outer text; the latter occupies 31 long lines written in 4 columns along the rest of the roll. The same practice is seen in P. Adler G3, G5, G9, G11, G13, G21, P. Lond. VII 2191, certainly from Gebelen. P. Merton I 6, however, of 77 B.C. is a double-deed of the traditional pattern, but written *along* the fibres.

The fact that there was discontinuity in Egyptian practice may be irrelevant to Roman practice. We have already noted that Roman republican consular despatches to the Senate when written on papyrus were written 'transversa charta' with the writing across the fibres. We shall now investigate whether Roman contracts in diploma/double-document form were written in the same way.

The credit for first recognising an example of such usage in a document from Egypt of the imperial age must go to A. S. Hunt. It is set out in his introduction to P. Oxy. XVII 2131 (published in 1927), a text of A.D. 207 written in Greek, an attested copy of a petition presented to the prefect and of his official subscription thereon, which had been publicly displayed at Antinoe. Hunt writes: 'Its form is especially interesting. The copy to be certified (B), written across the fibres of the papyrus, was begun at a distance of about 12 cm. from the top of the sheet. In this blank space, added in a more cursive hand, is a second copy (A) practically identical with the one below except for occasional use of abbreviation and the omission at l. 19 of a reference number. On the verso of the lower (original) copy, at right angles to it and 2.3 cm. apart, are the signatures of six witnesses, who sealed it. The document thus presents a close parallel to the *συγγραφοφύλαξ*-deeds of the early Ptolemaic age; cf. P. Eleph. 1-4, Hibeh 96, Wilcken, *Archiv* v, pp. 202 sqq. In the Roman period instances of attestation by six witnesses are not infrequent (cf. P. Oxy. 489 sqq., BGU 813 10 *δάνεια ἐξαμάρτυρ[α* etc.), but of the survival of the old practice of making two successive copies of the text [this papyrus, P. Oxy. 2131] seems to be the first example, though possibly another is now to be recognized in BGU 525 plus 970.' He might have added that being written 'transversa charta' with writing across the fibres this papyrus has a further point of contact with the old Ptolemaic system.

Hunt's guess about BGU 525 plus 970 (also an attestation of a copy of a prefectorial decision, dated A.D. 177) was confirmed almost at once by Wilcken 1930 p. 95 (who also found traces of the seal signatures on the back of 525 just where they were expected). Later on Kortenbeutel (Kortenbeutel 1932) published another attested deposition contained in a Berlin Papyrus (P. 13877 = SB V 7523), written in exactly the same way across the fibres and *transversa charta* in Greek and dated to A.D. 153. Moreover, as Wilcken 1935 p. 129-30 indicated, in a characteristic supplementary note, it is an original, not a copy as Kortenbeutel supposed; and the signatures of seven, not six, witnesses are to be presupposed.

4.8.3 In **4.2.2**-4 I set out at length reasons why P. Lond. 229, 1178 and possibly P. Oxy. XLI 2951 might be regarded as 'double documents'. I believe the parallels I have just quoted make this interpretation very plausible. In regard to the 'formless lumps of wax' on the back of the Boxer's diploma, P. Lond. 1178, the seals and names of witnesses on the back of P. Oxy. XVII 2131 are a particularly helpful parallel.

4.8.4 But a much longer list of parallels could be drawn up now. In addition to the texts already mentioned, it would include: —

A.D. 48	PSI XI 1183	Latin professio from Oxyrhynchus
A.D. 77	PSI VI 729	Latin sale of a horse
A.D. 87/8	P. Ryl. IV 611 = Ch.L.A. IV 248, Latin declaration by a veteran that he and his wife have received conubium. (No one has yet observed that its format, probably 'transversa	

	charta', certainly written across the fibres, makes it extremely probable that it is a double document.)
A.D. 92	P. Fayum (J. Barns 1949, pp. 296 ff.) Latin attestation of a legionary.
1st century	PSI VI 930 + plate. Latin contract of marriage. (Here also no one has observed that this text is likely to be one portion of a double document. It also is written across the fibres. The Greek writing on the back contains 2 recognizable names, one the name of a Roman citizen, and they will be the names of witnesses written alongside their now lost seals.)
2nd. century	P. Mich. VII 434 + P. Ryl. IV 612 = Ch. L. A. IV 249. Marriage contract. R. Marichal has got it right in Ch. L.A. P. Ryl. is the top of the (sealed) inner text, P. Mich. the top of the outer text, with witnesses' attestations on the back. In both pieces the text of the contract itself is 'transversa charta written across the fibres'. (A few of the faulty provisional solutions are discussed for their paradeigmatic value in Section 5.2.8 below.)
2nd century	P. Mich. VII 442 + plate. 'Document dealing with a dowry in Latin'. (The text is written transversa charta across the fibres; on the back, also against the fibres, names of witnesses written in Greek. Sanders himself supposed this was a four-page diploma on papyrus, as he supposed P. Mich. VII 434 to be. But there is no evidence for this fanciful explanation in either case.)
2nd century	P. Mich. VII 443 + plate. Latin: 'Soldier's Petition' (A possibility only. Parts of 5 lines written across the fibres.)
Late 2nd century	P. Mich. VII 445 Latin: 'Soldier's Document with five witnesses' (A possibility only. Written across the fibres, and looks like a deposition.)
A.D. 124	D.J.D. II 115 + plate (Benoit 1961, pp. 243 ff.). Contract for remarriage found at Murabba'ât, Palestine. Across fibres, scriptura interior presumably sealed (traces of witnesses' names on back), one horizontal kollesis (badly made, for it makes an oblique line of junction).
A.D. 142	P. Colon. inv. 6211 ined. Slave sale, written in Side (Pamphylia). Greek, double document, written across the fibres. 'Inner' text 11 lines, gap of about 5 cm., then outer text of which 11+ lines survive. (I owe the knowledge of this text to the kindness of Professor Dieter Hagedorn.)
A.D. 143	P. Columbia Inv. 325, Gilliam 1971 = S.B. X 10530, attested receipt for a soldier's *deposita*. Double document, scriptura interior rolled up and sealed with 7 seals on the back, each seal accompanied by a witness' name. The document is identified as a diploma by its scribe (ll. 1, 14): *ἐπὶ τῶν παρόντων καὶ σφραγισάντων τὸ δίπλωμα τοῦτο.*

A.D. 150	PSI IX 1026 + plates. Attested copy of a libellus in Latin. (Again it was Wilcken 1930 pp. 80-1, 95 who pointed out its nature as a double document. The ed. princeps says nothing of fibre direction. From the plate I think the writing is across the fibres.)
A.D. 151	BGU III 887 Slave sale, written in Pamphylia; Greek; first text 11 lines; second text 20 lines. Both include signatures. Ed. princeps says nothing about fibre directions. (Professor Dieter Hagedorn draws my attention to a facsimile in Bruns-Gradenwitz 1912 Taf. XXXV, which shows that it was written transversa charta, for it has 2 horizontal kolleseis.)
A.D. 206	BGU III 913 Myra in Lycia. Slave sale. (Needs verification. Ed. princeps has nothing to say about fibre direction. That it is a double document is clear from the text l. 3 [*τοὺς ὑπογεγραφότας καὶ ἐσφραγικότας εἰς τόδε τὸ δίπλωμα*]).
A.D. 359	BGU I 316 Ascalon. Slave sale. Plate in Wilcken 1891 xvi. Wilcken describes it thus: 'H. 68 cm., Br. 27 cm. 3 Klebungen. Die Schrift laüft parallel den Klebungen (also der Höhe)'.

P. Dura	26	Sale A.D. 227 Greek Upper text tied sheet, 3 lines, lower text 32 lines, 2 signatures on back, no seals
»	29	Deposit A.D. 251 Greek Upper tied sheet, 1 line lower text 24 ll.
»	30	Marriage contract A.D. 232 Greek Upper text tied sheet, 1 line, lower text 43 ll., signatures continue on back
»	32	Renunciation of property A.D. 254 Greek tied sheet 3 lines, lower text 23 ll., signatures continue on back

(In the case of none of the Dura papyri is it stated how the fibres run, and I cannot trust myself to identify them from the photographs.)

An additional series of double documents of the time of Hadrian will be available to throw light on the development of this form of text when the archive of Babatha found in March 1961 in the so-called 'Cave of the Letters' in Naha Hever (near Engedi on the Dead Sea) is published. Professor H. J. Polotsky has given a specimen of three texts with plates (Polotsky 1967), and many more details and some good plates are given by Yadin (1971). 23 of the 35 texts in the find are said by Yadin to be 'double' or 'tied' deeds, but some of these tied deeds are in Nabataean and some in Aramaic. The only Greek one I can positively identify is the deposition (*μαρτυροποίημα*) by Babatha of 12th October A.D. 125 (text and plate showing interior writing in Polotsky No. 12 = SB X 10288; plate showing inner writing folded up in Yadin pp. 242/3). This deed seems to be in Roman form (dating by consuls, year of Hadrian, month according to Roman calendar). I cannot see for certain from the plates whether it is in fact written across the fibres *transversa charta*, but I suspect it is for two reasons : (1) though no dimensions are given, a scale is visible in Polotsky's photograph, from which I calculate the size as about 35 cm. broad, 38 cm. high. This size is larger than any single papyrus sheet of this period, and I should expect there to be a kollesis. (2) I think the fibres of the rolled up cylinder of the inner writing are horizontal, i.e. they are the back fibres, as are those which show in P. Lond. 229.

4.9.1 To summarize the new results established in this section, it has been shown that in the Roman imperial period double documents / *diplomata* written 'transversa charta' and with the writing across the fibres, could cover the following subjects, whether written in Greek or Latin :

(a) Membership of a club (P. Lond. 1178)
(b) Sales
(c) Marriage contracts, renunciation of property (on divorce)
(d) Attestations on oath (P. Oxy. XVII 2131 ; P. Berlin 13877 ; P. Fayum ; P. Ryl. IV 611 ; SB X 10530 ; PSI IX 1026)
(e) Deposit
(f) Professio (PSI XI 1183)

4.9.2 Only after setting out these findings that the term *diploma* may refer to a document written on papyrus (a double document, with sealed *scriptura interior*) as well as to tablets of bronze or of wood (with or without wax), did I recollect that J. F. Gilliam in 1971 p. 65, in a thorough discussion of the term 'diploma', reached the same conclusion. Gilliam started from the need to account for the phrase *κατὰ δίπλωμα Ἑλληνικόν*. I welcome the fact that from the starting point of diplomatic my argument tends to the same conclusion as his.

4.9.3 Gilliam (1971 p. 67) with proper caution shows that though these double documents often have some features found in documents drawn up in Roman legal form, one cannot simply infer from the form of a double document/diploma that it belongs to the sphere of Roman law. I believe that all double documents on papyrus actually in Roman form are written *transversa charta* and constitute *diplomata* ; but not all documents written *transversa charta/diplomata* are drawn up according to Roman law.

4.9.4 Gilliam is inclined to believe that the phrase *δίπλωμα Ἑλληνικόν* means simply a document drawn up in the Greek language, rather than a document in which one or more of the parties is Greek, or the legal forms are Greek, not Roman. The following case should be added to the dossier. It is a papyrus recording the sale of a slave girl by auction at Rhodes (found at Oxyrhynchus but written at Rhodes) dateable between A.D. 238 and 244 (Oates 1969). The body of the text contains two columns of writing in a professional hand, followed by attestations of Rhodian magistrates etc. The second column is much damaged. Does it refer to the same or to a different transaction? Oates discusses the difficulties of either choice, and tentatively concludes that 'the document records the auction sale of a slave girl... treated as two separate acts, that of buying and that of selling'. That is, it is a double document using local legal forms. That the forms were not Roman is further suggested by the argument from diplomatic. The text is written along the fibres, on a piece from the inside of the roll, for there is a vertical kollesis (not mentioned by the editor). Recently a fragment has been identified in the Oxyrhynchus collection as written by the same principal scribe and one of the same attestors. At first it was thought to be a missing piece of this document. But it is not. It is part of another document written in Rhodes at the same time, in which at least one of the same persons is concerned ; parts of the text surving ' *ἐπράχθη ἐν Ῥόδῳ*' = *factum est Rhodi*, mention of the month of October and a possible consular date suggest it is a Greek version of a document in Roman form. Moreover it is written across the fibres, probably *transversa charta*, for nothing is visible on the back. From this fact alone I would argue that it is a different double document, imitating Roman, not Rhodian forms.

4.9.5 As an afterthought there occurs to me the likelihood that a sealed will, if written on papyrus and not on tablets, will have been set out in this form, viz. as a diploma/double document written on the roll *transversa charta*. This is how P. Elephantine 2 was written [above **4.5.1**(c)] in the third century before Christ ; so was the 'will of Abraham' (**4.12** below) in the sixth century after Christ. At two different places Grenfell and Hunt enunciate what is in effect the likelihood I have expressed as if it were a rule applying to the Roman period. The first is in their introduction to P. Oxy. I 105 (1898), the will of Pekusis written between A.D. 117 and 137 : 'as is usually the case with wills, the writing is on the vertical fibres of the papyrus and the lines are consequently of great length' [on P. Oxy. I 104 no remark is made]. The second is in their introduction to P. Oxy. III 489 (1903), a will of A.D. 117 : 'this and the following wills [i.e. Nos. 490-495], except 494, are written across the fibres of the papyrus ; cf. 583, 634 and 646-52. The seals of the testator and witnesses were attached to the outside of the roll, but these have not been preserved'. This last statement must be speculative, not factual.

I must confess that I have not had time to examine systematically the likelihood here expressed. Not only are surviving wills numerous ; editors rarely give the necessary diplomatic description, and inspection of the originals would be necessary. Yet I think it likely that such an examination would prove instructive. P. Oxy. 494 does not follow the 'rule' suggested, and it announces itself as a copy, not the original (l. 1 ; cf. the note on l. 25). Similarly the 'will of Taharpaesis' (Klamp 1968, Sijpesteijn 1969) announces itself as a copy, and is written along the fibres on the inside of a roll (a perpendicular *kollesis* is visible in Sijpesteijn's plate). It is because these are copies that they do not follow the 'rule'. P. Oxy. XXXVIII 2857 of A.D. 134 is described as a 'draft of a Roman will' by its editors, and the contents support their description. It is written along the fibres on the inside of the roll. Would the authentic will, if inscribed on papyrus, have been set out as a 'diploma' and written *transversa charta*? Can the diplomatic form be used to distinguish draft and authentic text? In this connection I note that P. Oxy. XXVII 2474, 46 lines of a document drawn up in Greek in the third century after Christ, is described as a 'will of a Roman citizen' by its editor L. Koenen and characterized by him as a draft. He does not say why he considers it a draft. I suppose one reason is 'that it is written along the fibres on the verso of a piece cut from a roll. The recto contains parts of three columns from an unpublished land register'. I presume it to be the editor's view that the land register was written first, and that the other side was then reused for the will, even though the latter was in fact written like a 'rotulus', *transversa charta*.

Another question that arises is : are these differences in diplomatic format adequate as criteria to distinguish between wills drawn up in Roman form and wills in Greek / Oriental form?

All these suggestions deserve systematic examination.

4.9.6 The wide-ranging hold on men's imaginations of the diploma / double document is attested by its choice as a central image by the author of the *Apocalypse* (*). At V 1 he writes of 'the person seated on the throne having on his right a *βιβλίον γεγραμμένον ἔσωθεν καὶ ὄπισθεν κατεσφραγισμένον σφραγῖσιν ἑπτά* (I give the text printed by Aland, Black, Metzger and Wikgren, United Bible Societies, London 1966). There are many variants (e.g. *ἔξωθεν* for *ὄπισθεν*) and many different punctuations of the passage, which cannot be discussed here (cf. Charles 1920 p. 136). I should myself prefer *ὄπισθεν*, without following comma, and should translate 'a roll written on the inside and on the back sealed with seven seals'. The 'inside' I take to be above all the *scriptura interior* ; but it includes the inside (§ **3.7** above) of the roll.

4.9.7 For the history of Roman diplomatic, the survival of the double document written *transversa charta* is of great interest. Rome modelled her diplomatic

---

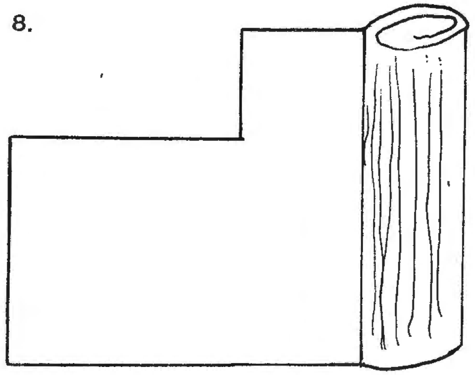
(*) I have to thank Dr. W. E. H. Cockle for this suggestion.

on Greek practice when it was at the stage revealed by the Elephantine contracts, royal letters and petitions as practised at the court of Ptolemy II. Egypt may, but need not have been the model. What is established is that the model was not Egyptian practice of the second or first centuries before Christ.

4.10.1 It may be worthwhile to consider the practice of writing *transversa charta* from the point of view of the scribe. There are several interlinked questions.

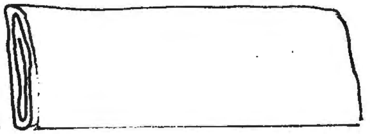
4.10.2 One reason why in both the Ptolemaic (**4.5.1**, **4.5.3-4**) and the Byzantine period (below **4.12**) this method may have been chosen may have been to economize on papyrus. Thus suggestion is made by Mr. T. C. Skeat. He points out that in the notice of Peukestas found at Saqqara (Turner 1974) the scribe knew he needed to write three lines only, but the letters must be large. 'If he had written on the inside of the roll along the fibres and had then cut out the piece, he would have been left with an awkwardly shaped roll :

8.



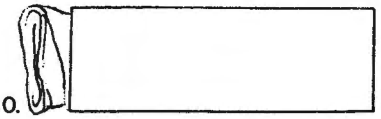
by writing *transversa charta* all possibility of waste was eliminated.' Following the same line of thought Mr. Parsons suggests that the set form established for *enteuxeis* (**4.5.4**) made it more economical to cut them from the roll *transversa charta*.

4.10.3 Did the scribe cut his piece from the roll before he began writing? Had he done so, he would have needed to know fairly accurately the length of letter that he proposed to write. Mr. Skeat raised this question also. In reply I suggested tentatively that the scribe need not have cut off his portion before writing. He could have kept the unused rolled-up papyrus close to his body and used it as a base to support his wrist when writing on a piece unrolled from the bulk and lying flat in front of him. My suggestion was less exactly phrased than this, and Mr. Skeat took it to mean that the scribe might have adjusted the unwritten rolled-up portion so that it served as its own base. This idea he did not reject (letter of 17 viii 1977). 'If papyrus in its original state was as soft and pliable as we believe it was, it would have been quite easy to flatten down the roll, thus :



9.

And of course it would be equally simple to write a short-lined letter by holding the flattened roll in a vertical position. Incidentally, this would explain why the typical short-lined letter, especially when written on a strip cut from the whole height of the roll, is remarkably constant in width, viz. between 8 and 12 cm. Of course, in either case, if the scribe was writing on the inside of the roll, and if the roll was rolled up in the normal way, he would have had to pull out a piece and fold it back on to the rolled-up portion of the roll, thus :



10.

Alternatively, if the scribe had a number of long-line letters to write, he could have re-rolled the whole roll (in a matter of less than a minute) so that the 'recto' was on the outside of the roll.'

Mr. Skeat's suggestion that the unwritten rolled-up portion of the roll could have served as its own base seems to receive confirmation from a Greek relief and inscription of the imperial period from Thessalonike to which Dr. G. Parássoglou (1977) has called attention. In this relief the scribe, seated on a stool, legs crossed and using his left knee as support, seems to be writing on that piece of papyrus lying immediately above the as yet unrolled portion of the roll. The latter in fact seems to serve him as a base in the way postulated by Mr. Skeat.

4.10.4 Dr. Parássoglou's inscription does not make clear whether the scribe is writing in selides on a roll in the horizontal position, or is writing *transversa charta*. No trace of a writing board is visible. The scribe's left forearm and left hand are underneath the roll, presumably supporting it.

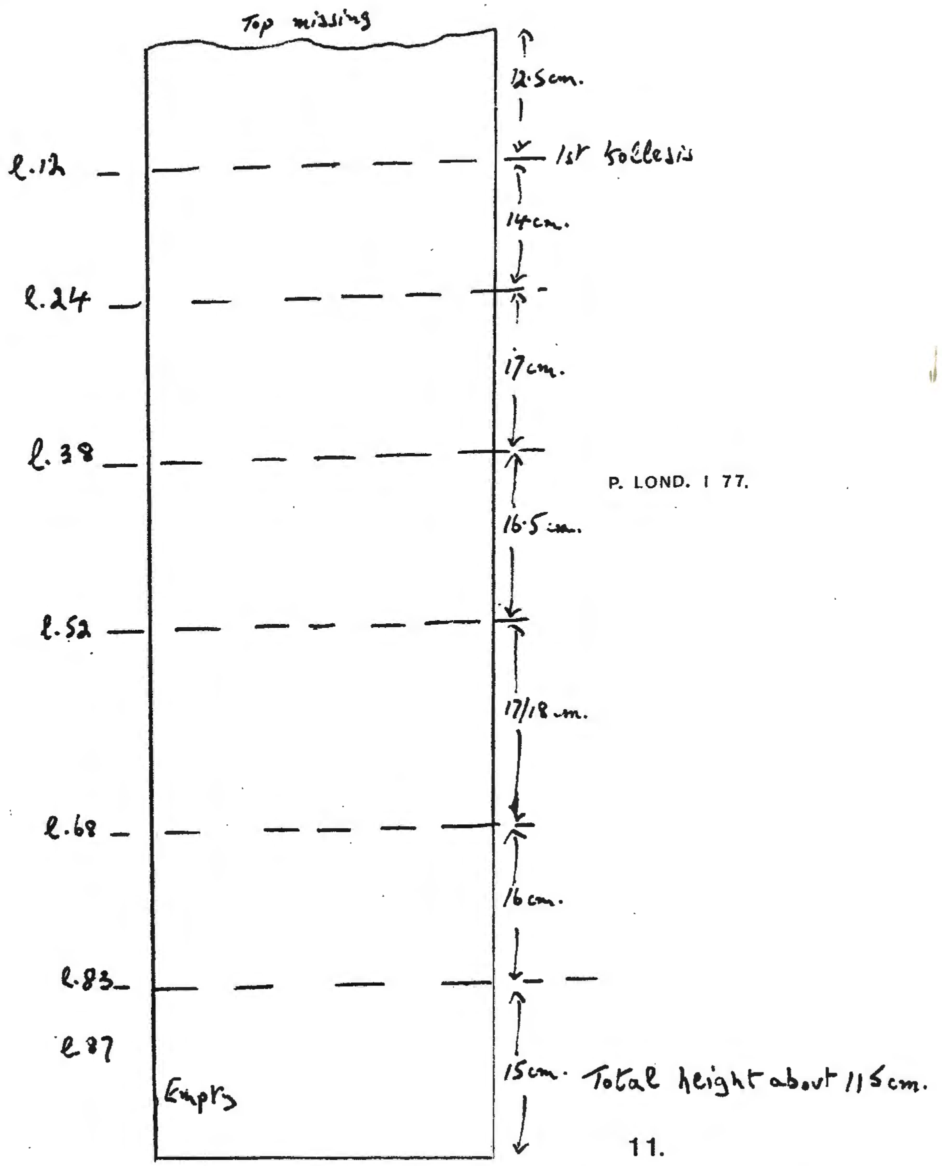
4.11 It is worth noting in passing that certain set forms of minor documents are usually written across the fibres (whether or not *transversa charta* I do not know). They include : —

(a) Orders for arrest
(See the discussion of G. M. Browne, P. Mich. Browne 589, pp. 50-51. There are some exceptions to the 'rule', but it applies to the majority of cases.)

P. Oxy. XXXI 2574 appears to have been cut off close to another document, the cut passing through the tails of three letters. Mr. Parsons has raised the question whether the format of such documents is dictated by a kind of mass-production : 'you write a number of them consecutively on a strip and then cut them up'. Another unknown factor, he writes, is whether such slips are oddments. 'Presumably government offices often found themselves left with remnants of rolls too narrow to be used the usual way up, but making a usable slip when rotated.'

(b) Invitations more frequently than would have been expected : (9 at least of the 29 invitations listed by T. C. Skeat 1975 p. 253 n. 2). One or two are certainly cases of re-using the back of an already written fragment ; whether that applies to the rest, I do not know. The number seems high in view of Skeat's suggestion that these invitations had a social cachet, rather like a bowl of Victorian or Edwardian visiting cards.

4.12 The 'vertically placed' roll never entirely disappears from view, even in the fifth century (I have not made a systematic search through all 5th century texts, but cf. **4.13.1**), but re-emerges massively in the sixth. A considerable number of 'rotuli' written across the fibres and *transversa charta* are to be found among the papyri found at Kom Ishgau — *Aphrodito*, or *Aphrodites kome* — between 1901 and 1907. Previous to their acquisition the British Museum had already listed some dozen rotuli of this character (under number P. Lond. I 113) from other provenances ; one example is the so-called Will of Abraham Bishop of Hermonthis (P. Lond. I 77) which should be dated to the sixth, not the eighth century after Christ. I offer a diagram of this text in Figure 11 :
In addition, many of the Syene papyri (now especially in London and Munich) of the later 6th century show the same format. The papyri found at Kom Ishgau were divided between many collections (cf. the preface to Sijpesteijn 1977) and are not by any means all published. But a large number of them in the Cairo collection (P. Cairo Maspero I - III), the British Museum (P. Lond. V), Florence (P. Fior. III), Alexandria (P. Michaelides 40-60) are now available. This very year 1977 Professor P. J. Sijpesteijn has published 16 more in P. Mich. XIII. His edition includes the tallest documentary rotulus known to me : P. Mich. 659, a *dialysis* or legal settlement to be dated between A.D. 527 and 542. Parts of 363 lines (and that is not all, for the text is incomplete) survive of a rotulus that measures 517 cm. along its long axis and is 29.5 cm. high (i.e. along the other axis) and has 27 horizontal kolleseis. For size this easily beats P. Lond. V 1708, a mere 265 lines, or P. Cairo Masp. ii 67151, 307 lines, both written in the same



11.

Fig. 11. — P. Lond. I 77 (pp. 231 ff.). "Will of Abraham". vi century.

format. These three (and many others of the texts in this archive) are written across the fibres, *transversa charta* — plainly so because of the horizontal lay of the kolleseis. Like H. I. Bell and David Crawford, Dr. Sijpesteijn describes them as 'rolled from the bottom up'.

I must however record puzzlement as to why the 'vertical' form is sometimes used, and sometimes the (previously) normal 'horizontal' form, in which the writing is along the fibres and set out in columns. Both formats are in use simultaneously, and the quick survey I have made indicates no reason why one should have been preferred to the other. (At **4.10**.2 economy is suggested.)

One possible reason for what seems almost indifference may be the experience of writing papyrus codices (in which pages with horizontally and vertically lying fibres must necessarily alternate). Perhaps this is what lies behind Schubart's mysterious statement (1921 p. 11) : 'the later Byzantine age loses, because of the newfangled huge writing, the comprehension of the advantages of the recto side'. This observation might possibly apply to single sheets, letters etc. (though if there is no kollesis how is it known they are not on the recto (= **3.1-2** above), even if written across the fibres?). But it cannot possibly apply to the rotuli we have been considering, the effective point about which is that they are written on the 'recto' side if recto means the inside of the roll.

4.13.1 Even earlier than the wills, leases, contracts, sales etc. which were being written in 'rotulus' form near Aphrodito in Egypt, the same format (or rather mixture of 'horizontal' and 'vertical' formats) was being used for inscribing papyrus rolls at Ravenna. In the last twenty years these texts have been subjected to an exhaustive analysis by Jan-Olof Tjäder (Tjäder 1955). He offers plates of 55 of them, and an account of 28 in his first volume of commentary. He follows papyrological usage (p. 83) in applying the term 'recto' to that side on which the fibres are at a right angle with the kollesis. In 'rotuli' the kolleseis will be horizontal : these texts he describes as 'quer geschrieben'. For 'horizontal rolls', those in which the kolleseis are vertical and the writing is along the fibres, he uses the term 'längs geschrieben'. He offers no explanation of why some follow one form, some the other, and it is not easy to see any reason behind the choice. For example, of 16 documents of gift (usually to a church) dated between A.D. 489 and the middle of the seventh century, 4 are in 'horizontal' form (with vertical kolleseis), 3 are uncertain, and 9 are 'rotuli' (i.e. with horizontal kolleseis). The 4 in 'horizontal' form were written in Syracuse in 489, Ravenna in 491 and 625 and Ravenna in the middle of the sixth century ; those in rotulus form date between 553 and c. 700, all written in Ravenna, except for one written in Rome.

The earliest dated 'rotulus' form from Ravenna is of A.D. 445/6. The greatest dimension is 2.6 metres (No. 20 = Vatican Pap. Lat. 6) in the direction of the long axis, 31 cm. in the other ; and this is incomplete. The size of the sheets I cannot trust my eyes to give from photographs.

4.13.2 Royal diplomas, especially those of the Merovingian kings, follow the same lay-out almost always in 'rotulus' form (Lauer-Samaran 1908).

4.13.3 Papal diplomas on papyrus of the ninth and tenth century can be studied in the recent facsimile volume (Diplomata 1929), which gives plates of 15 such diplomata dated between A.D. 819 and the eleventh century, now preserved in Spanish, Italian and German archives. Again the form is that of the 'rotulus'. These diplomata are not only of great size along their long axis; the shorter axis is also of considerable size (no. VI of A.D. 971 is 65 cm. in this direction — that is, it is a sheet the longest fibres of which are 65 cm.; No. X of A.D. 998 is 74 cm. in this same direction). No. VI shows 17 kolleseis running in a horizontal direction, the distance from kollesis to kollesis varying between 14 and 17 cm.

4.13.4 Rolls in Coptic may also be cited in the same format. The Consecration scroll of Bishop Timothy (Plumley 1975(1)), found at Qasr Ibrim in 1964, and to be dated c. A.D. 1370-1378, consists of a continuous paper scroll written in 166 lines *transversa charta*. It measures ± 482 cm. in length, 34 cm. along the other axis. Each sheet of paper is 49 cm. in length. I imagine there are many earlier examples which could be supplied by Coptic scholars.

4.13.5 Arabic papyrus scrolls also followed the 'rotulus' form. I quote one example only, the Arabic scroll to be dated to A.D. 758 containing a letter from the Governor of Egypt Musa Ibn Ka'b to the king of Nubia, found at Qasr Ibrim in 1972. In describing it Plumley 1975(2) writes: 'only the recto of the document had been used to record 69 lines of Arabic written in a large and beautiful hand (Pl. XXXVIII 2)'. Plumley is using 'recto', I presume, in my sense **2.1-2.2**. He says nothing of fibre direction or sheet-joins, but the dimensions alone, 255 cm. long, 53.5 cm. wide, must make it clear that the papyrus is written 'transversa charta'.

4.13.6 I do not intend here to embark on discussion of when the liturgy was first put into roll form. It is beyond my competence, and others have already taken up this point (Cavallo 1973; Daly 1973) Enough has been said to show that there is an acknowledged background of use of the rotulus for documentary purposes at the highest levels of temporal and spiritual authority. Daly writes (1973 p. 336): 'What these comparisons suggest to me is that the format of liturgy rolls was deliberately copied after that of imperial documents. That the prayers of the corporate church should be given a vehicle similar to that long in use for mundane petitions and that one of the most visible and august instruments of the church should be given the outer form of the most august document of the empire seems wholly fitting.'

4.14 Let us return to the ancient world. A very special case will arise if the 'rotulus' format is adopted on the back of a document, the front of which (known by its vertical kolleseis) has been written on in the normal way, along the fibres. This may involve particular difficulties of recognition to the editor if the papyrus is fragmentary.

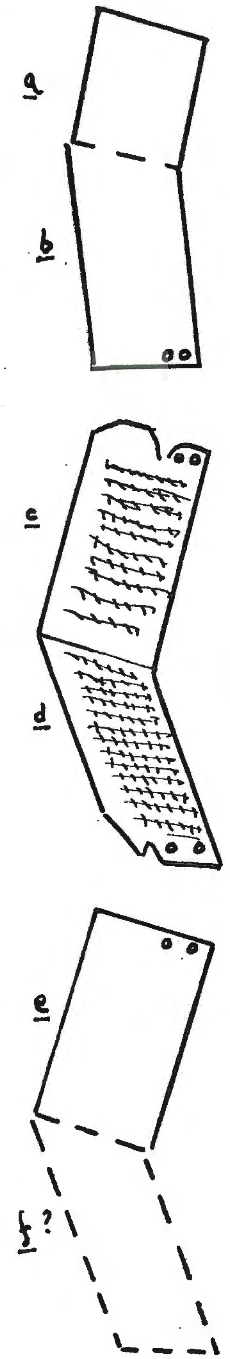
Dr. John Rea has called attention to such a case (Rea 1971). P. Flor. I 32, a registration of property to the censitor dated in A.D. 298, is a document written normally along the fibres. Actually it has been pasted to other documents (the preceding one of which was certainly a similar registration of property, of the succeeding one insufficient survives for judgment) to make a 'pasted-up roll', a *τόμος συγκολλήσιμος*. When it came to be re-used, this 'pasted-up roll' was rotated through ninety degrees, and was written as I have described a 'rotulus' being written, *transversa charta*, except that of course in this case the writing is with the fibres. The surviving portion of the back (P. Flor. I 33) does not begin at the beginning of the text, and this fact impeded recognition of its nature till it came into Dr. Rea's hands. 'It seems likely', Dr. Rea writes, 'that P. Flor. 33 was part of a long roll.'

He quotes as parallel an unpublished roll containing proceedings of a *logistes* of Oxyrhynchus dated c. A.D. 325 being worked on by Dr. R. A. Coles. This, too, is a *τόμος συγκολλήσιμος* rotated through ninety degrees when its back came to be written on (also along the fibres). It is also suggested that P. Oxy. XXXI 2562 (extract from a report of proceedings, after A.D. 330) may be a third example of the same format. The 'draft will' P. Oxy. XXVII 2474 (3rd century), written along the fibres *transversa charta* on the other side of a documentary register, is presumably another example (but see **4.9.5** above).

Since these particular fragmentary rotuli are written on the back (i.e. the outside), they are not strictly comparable with the rotuli from Kom Ishgau or from Ravenna, which they antedate by 150/200 years. But they imply a familiarity with a type of roll read from the top downwards.

4.15 Mr. T. C. Skeat adds an additional item: 'There is a *parchment roll* in the Chester Beatty library containing a work by St. Pachomius in Greek written *transversa charta*. Before it was identified I tentatively dated it to the fourth century. It has now been published (Quecke 1975). I have no idea why the rotulus form was employed in this case' (letter of 9. viii.1977).

4.16 The characteristics of 'rotuli' as here described may now be put in relation to the recently discovered Vindolanda tablets. In an interesting article (Bowman 1975) A. K. Bowman has pointed out the interest for 'the Roman book-form' of one set of accounting tablets made of alder or fir wood of the late first century

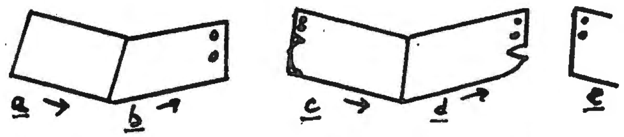


12. VINDOLANDA TABLETS
62v, 62vi, 47i, ii, 33i, ii, iii

redrawn from A.K. Bowman
1. *Britannia* v (1974) p. 363
2. ZPE 18 (1975) pp. 240-241

a = 62v + 47i
b = 47ii + 62vi
c = 33 i
d = 33 ii
e = 33 iii

c d and e are more or less complete.
a and b are virtually complete.
f may never have existed.



As originally drawn by A.K.B.
"→ shows direction of writing"

after Christ (publ. Bowman 1974). These tablets may be, as Bowman points out, arranged in either (a) a 'concertina' sequence, or (b) a format of independent, sequential diptychs. In case (a), he states (1975 p. 241) 'we have a piece of unique evidence for the development of the book-form at a crucial period in the early history of the codex'; if (b) is the correct view, 'it is still of considerable interest in the light of the codex form, even though the sheets are not laid one on top of another and then folded, as is the case with the codex proper'.

These points are certainly of great interest. But two reservations should be entered. First, the special advantage of the developed codex format is that both sides of the writing material are used (that is, the full potential of the surfaces is exploited). This is done in many wooden tablets, but not in the Vindolanda tablets. Secondly, Bowman's diagram of the tablets is misleading in that it suggests that the writing ran parallel to the long axis of the tablets (Bowman 1975 p. 240 n. 12 'The arrows indicate the direction of the writing'). In fact, the writing was across the width of each tablet. If they formed a 'concertina sequence' (which seems to me the likelier supposition), it was a concertina which worked from top to bottom, not from left to right. Bowman's diagram must be rotated through 90 degrees. In such a vertical concertina sequence we seem to have an exact counterpart to a roll written 'transversa charta' (**4.3** above). A diagram will make the exact state clear. These Vindolanda tablets are an example of Roman military diplomatic, in which thin wooden slivers replace the papyrus roll written 'transversa charta'. In this respect, as Dr. Bowman writes to me (letter 7 viii 1977) 'these tablets contrast strongly with most of the letters [among the Vindolanda tablets] which are written in two columns across the long margin; noticeably many (perhaps all) of the official or semi-official documents are *transversa charta*, whereas I have not yet found such an example in private correspondence'. See *Addenda*, p. 66.

It is irrelevant to the purposes of this paper to pursue in detail how the tablets may still be thought of as prefiguring the codex. Dr. Bowman, in the letter quoted, rightly insists that the user of these leaves 'might treat them as a paged notebook, "turning" the pages from bottom to top (instead of from side to side). Of course to turn from a/b face to c/d face, he has to grasp the pleat at b/c and bring it up to meet the top edge of a. If this is right, or even possible, it surely does have a bearing on the way in which folded sheets of writing material were used.'

5

SOME DIFFICULT CASES

5.1 Several examples of fragmentary papyri have been already called on (**3.5**.5 *protokollon* ; **4.8**.4 P. Ryl. IV 612 ; **4.14** P. Flor. i 32 and 33) to illustrate the difficulties small fragments have posed to an editor. It will have become clear from the examples that if a fragment of papyrus shows no kollesis, no absolutely confident answer can be given to the question 'which side is the recto ?' in either the sense of my § **2** or my § **3**. Wilcken's confidence is misplaced if you are not Wilcken (1887 p. 490 n. 1) : 'Doch entscheidet dann meistens fur ein geübtes Auge die oben besprochene Verschiedenheit der beiden Seiten des Papyrus', "For a practised eye the difference discussed earlier between the two sides of the papyrus is decisive".

5.2 There are, of course, a number of indications which may be helpful :

5.2.1 If the text, whether literary or documentary, is continued on the back (i.e. is truly opisthographic), no doubt is admissible. (Purely by way of illustration some examples of these will be given at **5.3**.)

5.2.2 If the text is a literary work, broken into many fragments all written along the fibres and the back is blank, even though no kollesis survives there is a strong likelihood that the writing was on the inside of the roll.

5.2.3 If the piece has been cut down in such a way that the whole of the writing on one side survives, but only a portion of the writing on the other, the side that survives complete was certainly written later. Many of the letters in the Heroninus archive are written in this way. The scribe cut out a piece of the size he needed. The roll from which he cut it might have been documentary (P. Flor. I 5, roll of census declarations from which a piece was cut by Syrus for a letter, P. Flor. II 255) or literary (P. Ryl. I 16, calligraphic copy of new comedy from which a piece was cut by the same Syrus for a letter, P. Ryl. II 236). I hope elsewhere to discuss this practice as revealed by the Heroninus archive.

5.2.4 In the case of a really large document (i.e. one dimension of which is large) a guess can be made at the original dimensions of the sheets out of which

the roll was constructed. An attempt will be made at collecting information on this topic in § **6** below. Thus, one can with some confidence assert (as was asserted in **4.5**.3) that P. Lond. VII 1954, one dimension of which is 42.5 cm., the other 14 cm., is cut *transversa charta* from the inside of a roll because no papyrus sheets of this date are known made to a width of 42 cms. or anywhere near that width ; but there are many examples of sheets up to 46/47 cm. high at this date. Similarly, though it has no kollesis, there can be no doubt that P. Oxy. II 270 (now B.M. Pap. 793), an indemnification of a surety of A.D. 94, was written on the recto (sense **3.2-4**), not only because it is written along the fibres and there is nothing on the back, but because it is a sheet measuring 15.8 cm. wide and 38.7 cm. high ; and the widest sheet known to me from the Roman period does not exceed 33 cm.

5.2.5 Documents on two sides of a papyrus fragment which bear dates were written in date order (Turner 1954) — unless there are special considerations. Two examples follow of such special considerations :

(a) P. Oxy. XXXIII 2672B is a petition to a strategus to be dated in A.D. 218, written along the fibres on a piece cut from the inside of a roll. On its other side is a copy (P. Oxy. XLII 3017) of the edict of the prefect Ti. Pactumeius Magnus issued in about A.D. 176/7. Some time after A.D. 218 someone found himself in need of a copy of Pactumeius' edict and utilized the back of the petition to make it. That this is the correct interpretation is certain from the fact that the petitioner in 2672B has subscribed in his own handwriting.

(b) P. Vindob. Tandem 3 is an application to an epistrategus to be dated in the early third century after Christ. On its back, P. Vindob. Tandem 1, is a letter of Ptolemy Philadelphus (of about 500 years earlier). Again someone (among the authorities of Heracleopolis ?) wished to make a copy in the third century after Christ. Internal evidence reinforces the inferences drawn from palaeography and diplomatic : not only is the letter written across the fibres in a good third century A.D. hand, but its titulature uses the anachronistic formula *Ptolemaios Philadelphos*. The application in P. Vindob. Tandem 3 is itself subscribed in the original applicant's handwriting.

5.2.6 In all the examples so far cited it has been possible to cite some objective criterion in support of what might be termed a 'common sense' judgment. But 'common sense' is an inadequate guide in these matters. For instance, common sense would suggest that draft petitions (when there is something on the other side of the papyrus), writing exercises etc. would normally be written on scrap-paper. But enough difficult cases can be found to prevent erection of a 'common sense' standard :

(a) Petitions: P. Abinn. 1 was written along the fibres on a new sheet of papyrus. Its author became dissatisfied with it, altered it, thereby making it unfit for presentation. It became scrap paper, and the back was used for accounts.

(b) Exercises: the point arose during the XVth International Congress in a paper presented by Dr. W. E. H. Cockle. Two lines of Virgil are repeated several times on one side of a large sheet without trace of kollesis, two columns of men's names in Greek (accounts or work gangs?) are written on the other. In both cases the writing is along the fibres. Which was written first? If 'common sense' insists that it was the list, not the exercise, then we must account for the case of P. Hawara 24 (Dow 1968). This too is a scribe's Latin writing exercise; both sides of the papyrus were used by the scribe for his exercise, on both sides the writing is along the fibres, one side has a vertical kollesis. Are we to conclude that an unused roll was employed for this exercise and when the inside was filled the roll was turned over so that the back could be similarly used? Or was this a piece cut from a roll which happened to include the kollesis?

I note in passing that P. Ryl. I 59 (cf. Turner 1956, p. 235), a calligraphic exercise in which the opening of Demosthenes, *De Corona* was copied several times, was written along the fibres, i.e. on an unused roll; on the other hand the hexameter line used as writing exercise in P. Oxy. XXXI 2604 was on the back of a piece of used papyrus.

5.2.7.1 When the writing, as in the case just discussed, is along the fibres (or, across the fibres) on both sides of the papyrus, the problem of priority is probably insoluble. There can be no certainty which side of P. Hibeh I 100 of about 267 B.C. (now in Brussels) is the recto and which the verso. It was written across the fibres on both sides. Grenfell and Hunt, who give the measurements as 14 cm. H × 7.9 cm. B, themselves admit uncertainty whether the private account or the receipt (left with some details not entered) is the earlier of the texts, but decide for the account because it is the smoother side. Bingen 1977 p. 17 leaves the matter uncertain. Fortunately not much turns on this example.

5.2.7.2 Let us look at a slightly more complicated case. A papyrus in Princeton published as P. Princeton III 114 (Medical Treatise) and 143 (payment of debt) has parts of two columns of a medical work in Greek written on one side, a note about a Latin payment of debt on the other. Both texts (as in P. Hib. I 100) are written against the fibres. In re-editing them recently D. R. Jordan (1975 p. 75 and plates) prudently refrained from categorising one side as front or recto, the other as back or verso. The original inventorizer, however, presumed the Latin text to be front or recto, for he assigned the inventory number GD 7601 R to it, leaving simply GD 7601 for the Greek text. I think he was right, for this reason: unmentioned by the first editor, but clearly visible on Jordan's plate are parts of 8 lines of Latin writing on the side that has the Latin text, and they are at a right angle to the Latin payment of debt already mentioned, and in a different Latin handwriting. Only a very few Latin letters survive of this writing, and I can read no complete single word. Since they run along the fibres, I should be inclined to say that the original text was a register kept in Latin written along the fibres; at a gap in this text a different Latin scribe inserted the note of payment due at right angles to the bulk of the writing on this side of the roll. Later the back of the whole register was reused for a copy of the medical treatise. (Incidentally, in P. Princeton III 143 read iii Idus, not Itibus.) [See *Addenda*, p. 66].

5.2.8 A particularly revealing case of double confusion of the recto senses **2.1-2** and **3.2 - 3.4**, compounded by a supposition that there was a kollesis where there was not, is offered by P. Ryl. IV 612 + Mich. VII 434 (recognized for what it is by R. Marichal, and included in my list of double documents in **4.8.4** above). The Michigan text itself consisted of 2 fragments; one was published by H. J. Wolff, another by H. A. Sanders. Wolff described the marriage contract as being on the verso, and the signature on the recto. He was rightly criticized by Wilcken 1939 p. 144: "firstly Wolff has confused recto and verso. According to him the text of the contract is written on the verso. He [Wolff] adds: 'It is written across the fibres'. Perhaps it was this observation which led him to make that supposition. But I have often in the past emphasized that direction of writing is completely irrelevant to the question which side is recto and which verso. That is simply a question of structure or manufacture. In this case what is alone decisive is the sheet-join [Klebung] which is visible in fragment a, parallel to the text of the contract: this shows that this side is the recto, for such sheet-joins are recognizable only on the recto. Therefore the text of the contract, both of a and b, is on the recto; and the seal attestations are on the verso where they belong. Now to the principal point: this Michigan text belongs to those *testationes* of Roman law which I have already discussed together with W. Kunkel in Arch. XI 129/30 (cf. also Arch. IX 95). For these the form of the double document is characteristic..."

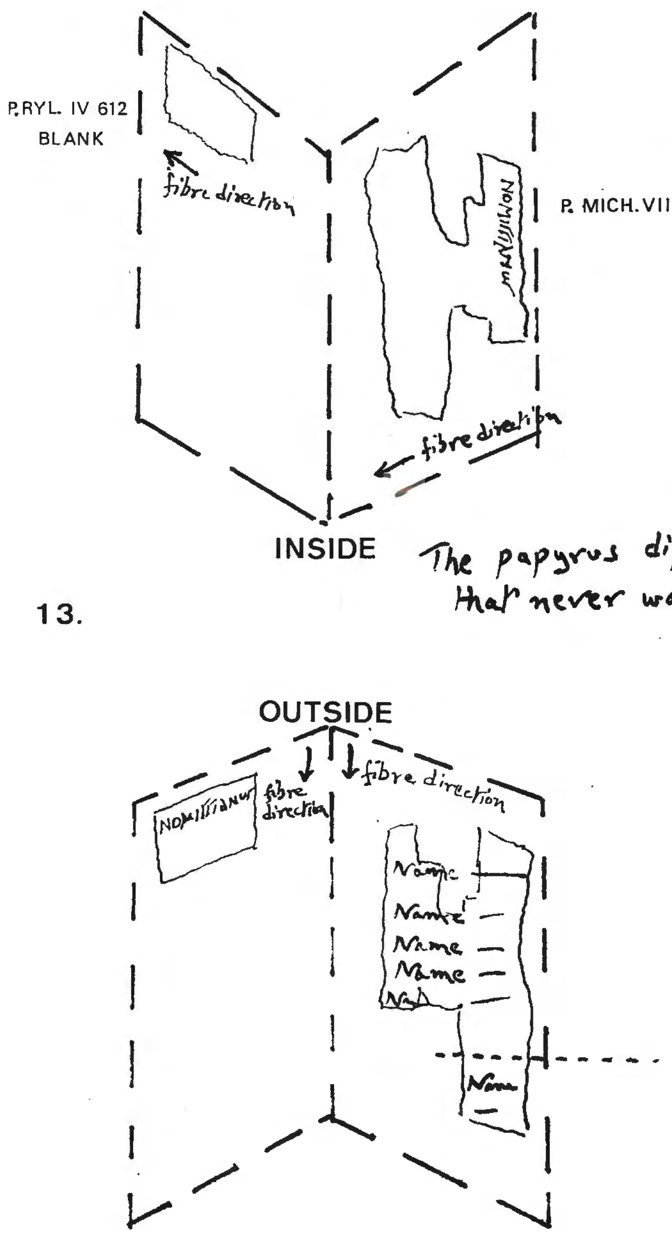
In spite of Wilcken's clarification, which he acknowledges but takes no other notice of than to write 'recto' where formerly 'verso' was written and vice versa, Sanders when he republished the text as P. Mich. VII 434 adhered to Wolff's view that the text was 'originally a diploma'. By this he meant that it was a papyrus sheet folded centrally to give two leaves, four pages (the model of the wax tablet or the military diploma of honesta missio on bronze was what lay in the forefront of his mind). 'The part preserved was from the first leaf of the diploma, and the text of the document stands on the recto of the papyrus but is written across the fibers. On the verso stand the remnants of the signatures of seven witnesses written at right angles to the text on the recto and spaced evenly to cover the whole width of the document. The position indicates that they were placed so as to follow closely the seven seals used to fasten together the ends of the double leaf, as on a diptych. The preserved part forms the first half of the inner copy of the document, the remainder of which was written on the inner side of the lost second leaf of the diploma. As the exterior of the first leaf carried the signatures of the seven witnesses, the exterior of the second leaf was free for the outside copy of the document, necessary to match completely the form of the wax tablet diptych.

On the verso one sees clearly where the two sheets of papyrus were pasted together...'

This supposed join of the two sheets can, in fact, be seen on Plate IV b of P. Mich. VII. Is it an illusion? There are two reasons for thinking it is: (1) when one draws out Sanders' imagined diptych (Figure 13), one sees that this sheet-join (which S. describes as on the 'verso') will run vertically, (2) it is directly contrary to Wilcken's described sheet-join, which is on the other side of the papyrus, the side that contains the Latin text, and according to Wilcken's observation runs parallel to the Latin writing, i.e. should be horizontal. Unfortunately, I cannot see Wilcken's sheet-join in the published plates. Autopsy in Ann Arbor ought to reveal the truth.

The supposed sheet-join mentioned by Sanders was no doubt what persuaded C. H. Roberts and myself to follow Sanders rather than Wilcken when we identified P. Ryl. IV 612 as what we called the 'scriptura exterior' of this marriage contract. 'Ryl. IV 612', we said, 'belonged to the second page of the diploma; on the verso [by which I suppose we meant the back page of this fanciful folded sheet; perhaps we also were influenced by the fact that the writing ran across the fibres], written across the fibres is the scriptura exterior, while the recto (the join alone would show it to be the recto) is blank' [and here a footnote referred to Wilcken's comments 1939 p. 144 and acknowledged their helpfulness, while at the same time implicitly rejecting them]. By 'join' we can only have meant the supposed sheet-join on what Sanders described as the 'verso' of P. Mich. VII 434. For there is no sheet-join (and I owe thanks to Dr. A. K. Bowman for reinspecting the original and confirming the point) on the unwritten side of P. Ryl. IV 612.

I have told this cautionary tale at some length. Perhaps it was unnecessary to do so, for Marichal in Ch. L. A. and P. Benoit (1961 p. 245 n. 11) have already rectified the error. But it shows how reputedly reasonable men can distort the meanings of 'recto' and 'verso'. Roberts and I simply misunderstood Wilcken 1939, who, I am now confident, saw the truth. P. Ryl. IV 612 was the scriptura



The papyrus diploma that never was

13.

interior (not the scriptura exterior); it was placed, as Marichal has placed it in Ch. L. A. IV 249, at the head of the 'rotulus', written *transversa charta*, and then rolled over and sealed down. The names of the witnesses written alongside these now lost seals are on the back of the rotulus, just where they would be expected, at the point where the 'scriptura exterior' of P. Mich. VII 434 begins, itself also written *transversa charta* on the front of the rotulus. This is exactly the system I have illustrated through **4.8.2-4** for the Roman double document.

As for Sanders' supposed imitation on papyrus of a wooden diptych, it is a will o' the wisp. I know of no example which could serve as parallel. In **4.8.4.** I have rejected Sanders' claim that P. Mich. VII 442 is a parallel.

5.3 It may be useful to have a list of some true 'opisthograph' papyri — that is, single sheets or rolls of papyrus, the content of which begin on the front, and then continue on the back (cf. Pliny Epp. III 5.17, where Pliny enumerates among his uncle the elder Pliny's literary relics 'electorum commentarios centum sexaginta . . . opisthographos', and N. Sherwin White's comment ad loc. 'commentarii' always means 'papyrus rolls').

5.3.2 Letters, official: P. Hib. I 45, Leodamas to Lysimachus, 257 B.C.
He has not finished his message, turns over the sheet and adds 5 more lines and the date on the back.
P. Hib. I 48, Another letter from the same official, same procedure.

5.3.3 Collections of related material:
Copies for a particular purpose, P. Jena Inv. 59 = SB VI 9312
P. Hib. II 198, Prostagmata, c iii B.C.
P. London VII 2188 (148 B.C.)
P. Mich. II 121 Grapheion records at Tebtynis (A.D. 42)
Copies: e.g. BGU III 747 (= W. Chr. 35). Letter of strategus of Coptite nome to prefect on front, prefect's reply on back. Both are copies.

5.3.4 Drafts: e.g. P. Oxy. XII 1469, c. A.D. 298, draft petition to prefect, begins on front, continues on back.

5.3.5 Tax Rolls: P. Bouriant 42, A.D. 167, 6 cols. on front, 13 on back, same hand.

5.3.6 Ostraca: e.g. W. Chr. 110A (110 B.C. Oath formula, begins on front, continues on back).
J. D. Ray, Archive of Ḥor, passim.

6

THE SIZES OF SHEETS IN A ROLL

6.1 The size of sheets: some remarks

What I have to say under this heading is disjointed and provisional. The subject deserves systematic examination, which it has never had. I do not wish any remarks of mine to discourage a young searcher from such an examination.

In *The Typology of the Early Codex* (Turner 1977) Chapter IV, esp. p. 48, I broached the subject, offering some provisional measurements made by myself. I stated that the greatest known height of a sheet was 46 cm., and the greatest breadth known to me was that found in P. Oxy. XXXVII 2806, a roll of Cratinus written by a professional hand in the 2nd century after Christ. No join could be found in the section published as fragment i which measures 32.5 cm. in breadth. E. W. Handley in an as yet unpublished paper (Handley 1977) has shown that fragment ii should be placed to the left of fragment i, and its horizontal fibres are identical: the sheet therefore may have been up to about 40 cm. broad.

I see that a distance of 36.5 cm. between sheet joins is recorded by F. Preisigke in P. Strasbourg I 6, a documentary roll (only 11 cm. high) of A.D. 255-261. One might wonder if this roll was made by cutting horizontally a much taller roll (a roll 44 cm. high cut into 4 horizontal strips, or 33 cm. high cut into 3 horizontal strips).

Anyhow, these two cases show that the maximum breadth as manufactured was greater than the 33/34 cm. I was willing to allow in Turner 1977 as being Pliny's *cubitalis macrocolis*. Moreover, I see that Černý 1952 p. 8 states that in the Middle Kingdom the breadth [he actually uses the term 'length', but he means what I term 'breadth'] "varies between 38 and 42 cm., sheets [broader] than this being exceptional; during the New Kingdom the [breadth] varied between 16 cm. and 20 cm."

I should like again to emphasize the apparently exceptional breadth of the two sheets of the Roman period mentioned above. The normal breadth, in so far as my observations go, is a figure below 20 cm. The only other sheet of a breadth of over 30 cm. known to me is that used by Subatianus Aquila's chancery in his famous letter of release, which is 32 cm. broad (PGB 35).

6.2 However, starting in the fourth century a change in the process of manufacture must have taken place, for one begins to find sheets of greater breadth. Schmidt and Polotsky (quoted Turner 1977 pp. 45 and 46) inferred that papyrus sheets of unusual quality and unusual size (31.5 H × 36 B ; 27 H × 35 B) were manufactured specially for some of the Coptic Manichaean codices. The papyrus sheet used by Abinnaeus (P. Lond. II 447 = P. Abinn. 1) for his petition to the emperors is a very large sheet without joins 50.8 cm. broad, 28.8 cm. high. (The papyrus gives the appearance of joins about 3 cm. from the top left edge, and again at the centre. But these joins are in reality folds.) It is no help to argue that 50.8 cm. is really the height of the sheet, and that it has been turned over and then rotated through 90 degrees, for 50.8 is *higher* than any other sheet observed by me up to the 4th century A.D.

From inspection of the make-up of the Coptic codices from Nag-Hammadi J. M. Robinson has concluded that *kollemata* of 'more than a metre' in breadth were used to make the rolls then cut up for the codices found there (Robinson 1975 p. 19 ; Robinson 1977). The quality of these sheets is far from fine : indeed they could only have been made by utilizing a length of stalk of the papyrus plant that manufacturers of an earlier age would have discarded (a consideration which incidentally reinforces the interpretation of 'principatus medio' in Pliny n.h. xiii 74 offered by Bülow-Jacobsen 1976). Nevertheless it must be accepted as established that such a change in manufacturing standards and methods took place (possibly as early as the third century A.D.). The existence of these large sheets made possible the construction of papyrus codices of enormously wide pages, such as the Oxyrhynchus Callimachus codex P. Oxy. XX 2258 (*page* without join at least 37 cm. broad), which I left unexplained in *Typology* (Turner 1977) pp. 49 and 53. Clearly these large sheets continued to be made right down to the 10th century : a papal diploma of A.D. 819 in *rotulus* form was 52 cm. across its short axis (*Diplomata* No. 1), one of A.D. 971 (*ibid.* no. 6) measured 65.5 cm., a *bulla* of 998 (*ibid.* no. 8) measured 74 cm. across the short axis. (Cf. **4.13**.3 above.)

7

PRACTICAL RECOMMENDATIONS

7.1 Where so much terminology has turned out to be equivocal, are there any recommendations to scholars so that misleading descriptions can be avoided in future? It seems to me that the terms 'recto' and 'verso' are hopelessly compromised, unless editors are willing to add a discriminant to them — as E. A. Lowe throughout CLA refers to e.g. the 'papyrological verso'. It would be thinkable but tiresome to use a formula such as 'recto (Turner **2.1**)' or 'recto (Turner **3.2**)'. It is much simpler to say 'front' and 'back' for sense **2.1** ; and 'inside' or 'outside' (viz. of the roll) for senses **3.2** (cf. above **3.7**).

7.2 First of all, a physical description of a papyrus text should always state whether the material has an identifiable kollesis (or kolleseis), and whether the kolleseis are horizontal or vertical in relation to the way the text is read. For the purposes of this record, kollesis should be taken to mean the visible line of junction, the terminal edge of the left-hand sheet which overlaps the next on the right (cf. **3.3**.4). (Only special circumstances need make it desirable to record the actual width of the overlap.) The *absence* of a kollesis should also be noted. In the case of a text written front and back, the side which has the kollesis (kolleseis) perpendicular to the fibres should be stated.

That they did not make statements on this point is one of the few genuine reproaches that can be levelled against Grenfell and Hunt, great men both of them, whose editions otherwise set a model to the world. In deciding that mention of the kollesis was unimportant they have exercised a profound influence, for the world has followed them rather than Ulrich Wilcken who was from the first scrupulous in drawing attention to the presence of a kollesis (*Klebung*).

As we have seen, if there is a kollesis, the side on which it is easily identified was the inside of the roll (if it is rolls we are speaking of ; and even in the case of codices, its presence has importance for it demonstrates that special sheets of papyrus were not manufactured to make that particular codex, but that a roll was cannibalized). Moreover, the distances apart of the kolleseis should be recorded if there is more than one. In the case of a 'horizontal' roll, i.e. where the kolleseis run vertically down the height of the roll, some such formula as the following could be used: '3 vertical kolleseis, 3.5 K^1 16.5 K^2 17 K^3 14 ...' where 3.5 means 'from the left 3.5 cm., then kollesis, after 16.5 cm. a second kollesis' etc. For a roll written *transversa charta*, substitute '3 horizontal kolleseis'. Such measurements will allow a rational classification of roll and codex sizes and formats. Moreover, when it is a case of reconstituting a broken original, a note of the presence of a kollesis may be as valuable a clue for reconstruction as the column height or number of letters in a line.

7.3 When the fragment has no kollesis, then the direction of the fibres in relation to the writing must be indicated. This may be stated in so many words: 'writing across' or 'writing along the fibres'. In recent years, however, a number of shorthand notations have been employed.

For a papyrus codex, a practical method is the use of arrows with a single point: →, a horizontal arrow when the fibres run across the page from side to side, ↓, a vertical arrow, when the fibres run from top to bottom of the page. The first person to use this system was, I think, the late Professor John Barns in the introduction to P. Ant. III p. xii, 1967: 'The high proportion in this volume of fragments of leaves from papyrus codices written on both sides by the same hand has made it necessary to indicate the direction of surface fibres by the use of the signs ↔ and ↕ respectively'. It will be observed that Barns used a double-headed arrow. Almost simultaneously in *Greek Papyri* (Turner 1968 p. 15, written in 1965) I recommended the use of a single-headed arrow. The single-headed arrow is used by J. van Haelst 1976 and by me throughout *The Typology of the Early Codex* (Turner 1977). It is now entrenched in the description of codices on papyrus. It allows the fibre-direction of a page with no writing to be expressed (for there is no doubt how a codex should be held in order to be read). I have myself made extensive use of it to express the successions of fibre direction in a gathering in a codex (e.g. ↓ → ↓ → ... to centre, then → ↓ → ↓ ...to end of gathering, the characteristic feature of early single-quire codices on papyrus).

7.4 In recent volumes of *The Oxyrhynchus Papyri* (from Part XLI on) this use of arrows has been extended to fragments or sheets of papyrus which are not parts of codices. But its use introduces a new ambiguity. In the case of a codex, even if only a part of a single leaf survives, there is no doubt how the papyrus should be held in relation to the eye: the writing must be horizontal, therefore → will also mean the side with the horizontal fibres, ↓ the side with the vertical fibres. But with a piece cut from a roll on which no kollesis survives, such need not be the case; and yet analogy with the use of arrows for codex pages may suggest that it is. The ambiguity is revealed by the cases of Latin calligraphic exercises (**5.2**.6), writing with the fibres on both sides (to be noted as → on the system of P. Oxy. XLI), or of P. Hibeh I 100 (**5.2**.7.1) and P. Princeton III 114/143 (**5.2**.7.2) where the fibre-direction is against the main writing on both sides and on the system of P. Oxy. XLI would be noted as ↓ . For P. Hib. I 100 I see no way of resolving it; in the Princeton papyrus I suggested a way in which it could be resolved — since one side (which I consider the 'inside') has Latin entries, some of which go with the fibres, some of which go against the fibres.

There is a simple expedient to reveal the doubt in the editor's mind: in the case of pieces of papyrus cut from a roll where no kollesis survives, the direction of the fibres in relation to the writing should be shown by a double-headed arrow in future publications. The single-headed arrow should only be used in the case of papyrus codices.

ADDENDA

P. 53, **4.16**. — Mr. E. R. Courtney calls attention to the support given to this interpretation by Juv. vi 482 'longi relegit transversa diurni', a much discussed passage. Translate "she rereads the entries written cross-wise in a long roll of accounts". *Longum diurnum* was correctly explained by the scholiast as 'account book'. *Transversa* is epithet transferred from the expected *charta* (ablative) to accusative plural neuter (sc. to qualify a substantive such as *verba*); these entries are to be imagined as written exactly as in the Vindolanda tablets I quoted, from side to side of a narrow roll held vertically, just such a 'rotulus' as I have supposed these Vindolanda tablets to imitate.

P. 57, **5.2**.7.2. — I now see that P. Princeton III 143 has been republished by R. Marichal in Ch. L. A. IX.

BIBLIOGRAPHY

Avery 1936 = Myrtilla Avery. *The Exultet Rolls of South Italy* II. Princeton 1936 (volume I never published).

Barns 1949 = John Barns, 'Three Fayûm Papyri : Affidavit of a legionary'. *CdÉ* XXIV (1949) 296 ff.

Barns-Kilpatrick 1957 = J. W. B. Barns, G. D. Kilpatrick 'A new Psalms Fragment'. *Proc. Brit. Acad.* XLIII (1957) 229 ff.

Barns 1967 = J. W. B. Barns, *The Antinoopolis Papyri* Part III. London 1967 (esp. p. xii).

Bataille 1954 = A. Bataille, *Pour une terminologie en paléographie grecque.* Paris 1954.

Bataille-Cadell 1966 = H. Cadell, *Papyrus de la Sorbonne*. Paris 1966 (esp. p. viii).

Beazley 1948 = J. D. Beazley, 'Hymn to Hermes'. *AJA* 52 (1948) 336 ff.

Bell 1948 = H. I. Bell, *Egypt from Alexander the Great to Justinian.* Oxford 1948.

Benoit 1961 = P. Benoit, *Les Grottes de Murabbaʿat* (= D.J.D. II). Oxford 1961.

Bingen 1977 = J. Bingen, avec la collaboration de M. Lewuillon-Blume et Jan Quaegebeur, 'Au temps où on lisait le grec en Égypte' Catalogue de l'exposition de papyrus et ostraca. Brussels 1977.

Binsfeld 1973 = Wolfgang Binsfeld, 'Lesepulte auf Neumagener Reliefs'. *Bonner Jahrb.* 173 (1973) 201-206.

Birt 1907 = Theodor Birt, *Die Buchrolle in der Kunst*, 1907.

Bowman 1974 = A. K. Bowman, 'Roman Military Records from Vindolanda'. *Britannia* 5 (1974) 360 ff.

Bowman 1975 = 'The Vindolanda Tablets and the development of the Roman Book Form', *ZPE* 18 (1975) 237 ff.

Bruns-Gradenwitz 1912 = C. G. Bruns, *Fontes Iuris Romani Antiqui*, II *Simulacra*. . . edidit O. Gradenwitz, Tübingen, 1912.

Bülow-Jacobsen 1976 = A. Bülow-Jacobsen, 'Principatus medio', *ZPE* 20 (1976) 113 ff.

Butler-Cary 1927 = H. E. Butler, M. Cary, C. Suetonii Tranquilli Divus Iulius. Oxford 1927 (esp. p. 120).

Cavallo 1973 = G. Cavallo, *Rotoli di Exultet dell' Italia meridionale.* Bari 1973.

Černý 1952 = J. Černý, *Paper and Books in Ancient Egypt.* London 1952 (Inaugural lecture at University College London 1947).

Charles 1920 = R. H. Charles, *A critical and exegetical Commentary on the Revelation of St. John.* Edinburgh 1920. Esp. Vol. I 136-139.

Cockle 1977 = W. E. H. Cockle, 'A new Virgilian writing exercise from Oxyrhynchus', paper delivered at XVth International Congress of Papyrologists.

Collomp 1926 = P. Collomp, *Recherches sur la Chancellerie et Diplomatique des Lagides.* Paris 1926.

Daly 1972 = Lloyd W. Daly, '*Rotulus Beratinus*, a Greek Liturgy Roll'. *GRBS* 13 (1972) 109 ff.

Daly 1973 = idem, 'Liturgy Rolls and Formal Documents', *GRBS* 14 (1973) 333 ff.

Diderot 1765 = *Encyclopédie de Diderot ou Dictionnaire raisonné des Sciences* XIII s.v. RECTO, XVII s.v. VERSO. Paris 1765.

Dow 1968 = Sterling Dow, 'P. Hawara 24 reconsidered', *J.R.S.* 58 (1968) pp. 60-70.

Diplomata 1929 = *Pontificum Romanorum Diplomata Papyracea phototypice expressa.* Rome, Vatican 1929.

Edgar 1931 = C. C. Edgar, *Zenon Papyri in the University of Michigan Collection* (P. Mich. Zen.). Ann Arbor 1931.

Esdaile 1931 = A. Esdaile, *A Student's Manual of Bibliography.* London 1931 (cited from 2nd edition 1932).

Gardthausen 1911 = V. Gardthausen, *Gr. Paläographie*^{2}. Leipzig 1911.

Gerstinger 1954 (1) = H. J. Gerstinger, 'Das Faustkämpferdiplom des Boxers Herminos'. *Festschrift des Institutes fur Leibeserziehung a.d. Univ. Graz*, Graz 1954.

Gerstinger 1954 (2) = idem, *Anzeiger phil.-hist. Klasse d. öst. Akademie d. Wissenschaften* 91 (1954) nr. 4, 57 ff.

Gilliam 1967 = J. F. Gilliam, 'The Deposita of an auxiliary soldier', *Bonner Jahrbücher* 167 (1967) 233-243.

Gilliam 1971 = J. F. Gilliam, 'The sale of a slave through a Greek *diploma*', *J.J.P.* xvi-xvii (1971) 63-70, esp. 65 ff.

Grenfell and Hunt 1897 = B. P. Grenfell, A. S. Hunt, P. Grenfell II pp. 211-6, 1897.

Guéraud 1931 = O. Guéraud, *Enteuxeis.* Cairo 1931.

Handley-Turner 1976 = E. W. Handley/E. G. Turner 'A Fragment of Epicharmus?'. *Wiener Studien* n.f. Band 10 (1976) 48ff.

Handley 1977 = T.B.L. Webster Memorial Lecture (forthcoming).

Ibscher 1913 = H. Ibscher, 'Beobachtungen bei der Papyrusaufrollung'. *Archiv f. Papyrusforschung* V (1913) 191 ff.

Immerwahr 1964 = H. R. Immerwahr, 'Book Rolls on Attic Vases'. *Classical, Mediaeval and Renaissance Studies in Honor of Berthold Louis Ullman*, ed. Charles Henderson Jr., Rome 1964 (Storia e Litteratura, Raccolta di Studi e Testi 93) 17 ff.

Immerwahr 1973 = H. R. Immerwahr, 'More Book Rolls on Attic Vases', *Antike Kunst* 16 (1973) 143 ff.

Jordan 1975 = D. R. Jordan, 'New Readings in P. Princeton 114, A Treatise on Tumours'. *BASP* XII (1975) 75-77.

Kenyon 1899 = F. G. Kenyon, *The Palaeography of Greek Papyri.* Oxford 1899.

Kenyon 1951 = F. G. Kenyon, *Books and Readers in Ancient Greece and Rome.* 2nd edition, Oxford 1951.

Kortenbeutel 1932 = H. Kortenbeutel, 'Ein Kaisereid', *Aegyptus* XII (1932) 128 ff.

Klamp 1968 = D. Klamp, 'Das Testament der Taharpaesis'. *Z P E* 2 (1968) 81 ff.

Kraeling 1953 = Emil G. Kraeling, *The Brooklyn Museum Aramaic Papyri.* Yale University Press, 1953.

Lauer-Samaran 1908 = Ph. Lauer, Ch. Samaran, *Les diplomes originaux des Mérovingiens.* Paris 1908.

Lewis 1934 = N. Lewis, *L'industrie du papyrus dans l'Égypte gréco-romaine.* Paris 1934.

Lewis 1974 = N. Lewis, *Papyrus in Classical Antiquity.* Oxford 1974.

Lobel 1957 = E. Lobel, *The Oxyrhynchus Papyri* XXIV pp. 89-90 ad No. 2396. London 1957.

Lowe 1934 = E. A. Lowe, *Codices Latini Antiquiores.* Oxford 1934-1971.

Mabillon 1681 = J. Mabillon, *De Re Diplomatica Libri VI.* Paris 1681.

Marichal 1963 = A. Bruckner, R. Marichal, *Chartae Latinae Antiquiores*, esp. Part III. Olten and Lausanne 1963 — Part IV 1967.

Martin 1964 = V. Martin, Papyrus Bodmer XX. Geneva 1964.

Montevecchi 1973 = O. Montevecchi, *La Papirologia.* Turin 1973 (esp. 14ff).

Montfaucon 1708 = B. de Montfaucon, *Palaeographia Graeca.* Paris 1708.

Murray 1888- = J. A. H. Murray, *New English Dictionary*, Oxford (= N.E.D.) 1888-

Oates 1969 = J. F. Oates, 'A Rhodian Auction of a Slave Girl', *JEA* 55 (1969) 191-210.

Parássoglou 1977 = G. Parássoglou 'The Position of the Greek and Roman Scribe' (communication presented to XVth International Congress of Papyrologists).

Pattie-Turner 1974 = T. S. Pattie, E. G. Turner, *The Written Word on Papyrus, Catalogue of an Exhibition at the British Library, July-October 1974.* London 1974.

Peter 1901 = H. Peter, *Der Brief in d. röm. Litteratur.* Leipzig 1901.

Plumley 1975 (1) = J. M. Plumley, *The Scrolls of Bishop Timotheos.* London 1975.

Plumley 1975 (2) = J. M. Plumley, 'An Eighth Century Arabic Letter to the King of Nubia'. *JEA* 61 (1975) 241-5.

Polotsky 1967 = H. J. Polotsky, *Eretz Israel* VIII (1967) 46-51.

Porten = Bezalel Porten, 'Aramaic papyrus: physical format and textual reconstruction' (paper announced for XVth International Congress of Papyrologists, but not delivered).

Quecke 1975 = H. Quecke, *Die Briefe Pachoms: Griechischer Text d. Handschrift W. 145 der Chester Beatty Library*, Regensburg 1975 (= *Textus patristici et liturgici* II).

Rea 1971 = J. R. Rea, 'Notes on some IIId and IVth Century Documents'. *CdÉ* XLVI (1971) esp. p. 142-3.

Robert 1962 = Paul Robert, *Dictionnaire alphabétique et analogique de la langue française.* Paris 1962 (1951-1964).

Roberts 1933 = C. H. Roberts, 'A note on Suetonius, Divus Julius 56, 6'. *JRS* xxiii (1933) 139 ff.

Robinson 1975 = J. M. Robinson, 'Les Textes de Nag Hammadi'. Colloque du Centre d'Histoire des Religions, Strasbourg 1975, pp. 15-31, Leiden 1975.

Robinson 1977 = J. M. Robinson, 'Codicological Analysis of Nag Hammadi Codices V and VI and Codex Berolinensis 8502' (known by personal kindness of the author: to be published 1977).

Santifaller 1953 = L. Santifaller, *Beiträge z. Geschichte der Beschreibstoffe im Mittelalter*. Graz-Köln 1953.

Santifaller 1965 = L. Santifaller, 'Über späte Papyrusrollen und frühe Pergamentrollen'. *Speculum historiale*, Freiburg-München 1965, 117-133.

Schubart 1918 = W. Schubart, *Einführung in die Papyruskunde*, Berlin 1918.

Schubart 1921 = W. Schubart, *Das Buch bei den Griechen und Römern*. 2nd edition, Berlin 1921.

Schwartz 1965 = J. Schwartz, compte rendu de (Martin 1964). *CdÉ* XL (1965) 436 ff., esp. p. 440.

Sijpesteijn 1969 = P. J. Sijpesteijn, 'Das Testament der Taarpaesis', *Z P E* 4 (1969) 47 ff.

Sijpesteijn 1977 = P. J. Sijpesteijn, The Aphrodite Papyri in the University of Michigan Collection (P. Mich. XIII). Zutphen 1977.

Sirat [nd = 1976] = C. Sirat, *Écritures et Civilisations* (Institut de recherche et d'histoire des Textes, CNRS). Paris n.d. [1976].

Skeat 1969 (1976) = T. C. Skeat, 'Early Christian Book Production: Papyri and Manuscripts', Chap. III of Volume II, *Cambridge History of the Bible*, ed. G. W. H. Lampe, Cambridge 1969 (Italian translation *La produzione libraria cristiana*, Florence 1976).

Skeat 1975 = T. C. Skeat, 'Another Dinner Invitation from Oxyrhynchus' (P. Lond. Inv. 3078). *JEA* 61 (1975) 251-4.

Skutsch 1968 = O. Skutsch, *Studia Enneana*, London 1968, esp. p. 171.

Tait 1974 = W. J. Tait, 'The physical characteristics of the [Saqqara] papyri', Proceedings of the XIVth International Congress of Papyrologists, Oxford 1974, 262-4.

Thompson 1912 = E. Maunde Thompson, *Introduction to Greek and Latin Palaeography*. Oxford 1912.

Tjäder 1955 = Jan-Olof Tjäder, *Die nicht-literarischen lateinischen Papyri Italiens aus d. Zeit 445-700* (Skrifter utgivna av Svenska Institutet I Rom XIX 3), Lund 1954, Plates, Part I 1955 = XIX 1).

Turner 1954 = E. G. Turner, 'Recto and Verso'. *JEA* 40 (1954) 102 ff.

Turner 1956 = E. G. Turner, 'A writing exercise from Oxyrhynchus'. *Museum Helveticum* 13 (1956), 236-8.

Turner 1968 = idem, *Greek Papyri*. Oxford and Princeton 1968.

Turner 1971 = idem, *Greek Manuscripts of the Ancient World* (*GMAW*). Oxford and Princeton 1971.

Turner 1973 = idem, *The Papyrologist at Work*. G R B Monograph No. 6, Durham, N.C. 1973.

Turner 1974 = idem, 'A Commander in Chief's Order from Saqqara', *JEA* 60 (1974) 239 ff.

Turner 1975 = idem, 'Four Obols a day men at Saqqara'. *Le Monde grec: Hommages à Claire Préaux*, Brussels 1975, 573 ff.

Turner 1977 = idem, *The Typology of the Early Codex*, Philadelphia 1977.

van Haelst 1961 = J. van Haelst, 'Deux nouveaux fragments de Jérémie'. *Recherches de Papyrologie* I (1961) 113 ff.

van Haelst 1969 = idem, 'Une nouvelle reconstitution du papyrus liturgique de Dêr Balizeh', *Ephemerides Theologicae Lovanenses* 45 (1969) 444 ff.

van Haelst 1976 = idem, *Catalogue des papyrus litéraires juifs et chrétiens*, Paris 1976.

Vergote 1946 = J. Vergote, 'Un problème de diplomatique', *Muséon* lix (1946), 253-8.

Viereck 1908 = P. Viereck, 'Aktenstücke z. gr.-röm. Vereinswesen'. *Klio* 8 (1908) 413 ff.

Wendelbo 1977 = O. Wendelbo, *The Use of Proteolytic Enzymes in the Restoration of Paper and Papyrus*, Bergen 1977.

Wilcken 1887 = U. Wilcken, 'Recto oder Verso'. *Hermes* 22 (1887) 487 ff.

Wilcken 1888 = idem, 'Zu den Berliner Fragmenten der *Athenaion Politeia* des Aristoteles'. *Hermes* 23 (1888) 464 ff.

Wilcken 1891 = idem, Tafeln z. älteren gr. Palaögraphie, Leipzig and Berlin 1891.

Wilcken 1901 = idem, 'Zur Palaögraphie' (review of Kenyon 1899). *Archiv für Papyrusforschung* I (1901) 354 ff.

Wilcken 1906 = idem, 'Ein Sosylos-Fragment', *Hermes* 41 (1906) esp. p. 104 and n. 1.

Wilcken 1912 = idem, *Grundzüge und Chrestomathie der Papyruskunde*, I 1. Leipzig-Berlin 1912, esp. xxx ff. xlvii.

Wiclken 1913 = idem, 'Urkundenreferat'. *Archiv f. Papyrusforschung* V (1913), 200-207.

Wilcken 1920 = idem, 'Zu den Kaiserreskripten', *Hermes* 55 (1920), esp. p. 25.

Wilcken 1927 = idem, *Urkunden d. Ptolemäer-Zeit*. Berlin-Leipzig 1927-

Wilcken 1930 = idem, 'Urkundenreferat'. *Archiv f. Papyrusforschung* IX (1930), 80-1, 95.

Wilcken 1935 = idem, 'Urkundenreferat'. *Archiv f. Papyrusforschung* XI (1935) 129-30.

Wilcken 1939 = idem, 'Urkundenreferat'. *Archiv f. Papyrusforschung* XIII (1939) 144.

Yadin 1971 = Y. Yadin, *Bar-Kokhba*. Jerusalem 1971.

Youtie 1936 = H. C. Youtie, review of N. Lewis 'L'Industrie du papyrus dans l'Égypte gréco-romaine'. *A.J.Ph.* 57 (1936) 217 ff. (= *Scriptiunculae* II 717 ff. esp. p. 719).

Zauzich 1969 = K. Zauzich, *Die ägyptische Schreibertradition in Aufbau, Sprache und Schrift der demotischen Kaufverträge aus ptolemäischer Zeit*. Wiesbaden 1969.